CENTIMETERS



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A SELECTIVE MICROFILM EDITION PART V (1911-1919)

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Thomas A. Edison Papers

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The original documents in this edition are from the archives at the Edison National Historic Site at West Orange, New Jersey.

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START

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PATENT SERIES
PATENT APPLICATION FOLIOS

Patent Series Patent Application Folios (1911-1931)

These folios contain formal patent applications, related legal dements, and correspondence between Edison's attorneys and the U.S. Patent Office. Most of the folios also contain additional litems such as notes and drawings by Edison; draft specifications in Edison's hand and other specifications with his notations; patent attorneys' notes and memoranda; communications between Edison and his attorneys; and related correspondence authored by or sent to Edison, his associates, and his companies. Typically, the applications were revised by Edison's lawyers several times over a period of years in response to the Patent Examiner's findings. Some were eventually abandoned because they were ultimately deemed unpatentable. Others were approved by the Patent Office but need became issued patents because Edison declined to pay the final fees, having exhausted the strategic value of fetting the application's soak' for several years in the Patent Office but need to the deal of the pay the final fees, having exhausted the strategic value of fetting the application's soak' for several years in the Patent Office but need to the deal of the pay the final fees, having in the Patent Office but need to the deal of the pay the final fees, having in the Patent Office but need to the deal of the pay the final fees, having in the Patent Office but need to the deal of the pay the final fees, having in the Patent Office but need to the pay the final fees, having in the Patent Office but need to the pay the final fees, having in the Patent Deal of the pay the final fees, having in the patent Office but need to the pay the final fees, having in the patent Office but need to the pay the final fees, having in the patent Office but need to the pay the final fees, having in the patent Deal of the pay the final fees, having in the patent Office but need the pay the final fees, having the patent Deal of the pay the final fees having the pay the final fees have t

During the period 1911-1931 Edison executed 113 successful patent applications relating to primary and storage batteries, business and musical phonographs, disc and cylinder records, the kinetophone (a phonograph and motion picture projector combination), cement, and other subjects. Many of the applications pertain to the Diamond Disc phonograph, which Edison introduced toward the end of 1912. An outline of eighteen patents that he planned to pursue in support of his new phonograph can be found at the beginning of Folio 906. Other technologies for which Edison sought patents, not always successfully, include the use of paraphenylenediamine as condensing agent for shellac (to make phonograph records); chemical processing methods for storage battery components and other products; concrete furniture and other concrete products; projectiles (related to his research for the U.S. Navy during World War I); phonograph reproducers; and automobile electrical systems. Among the thirty-seven patents that he received during the last decade of his life (four others were issued posthumously) are two for rubber processing and one for a radio or telephone receiver based on osmotic action, dubbed the "osmophone" (folio 1231).

Digital images of all of Edison's issued patents can be found on the Thomas A. Edison Papers (TAEP) website. In addition, images of these and other inventors' issued patents, along with a searchable database, are available on the U.S. Patent Office website. A nearly complete set of application files for Edison's U.S. patents can be found in the National Archives (Record Group 241, Records of the Patent Office). Because the formal spedifications and Patent Office correspondence in the case files at the National Archives are already available on microfilm, identical material in the case files at the Edison National Historic Site has not been selected. Also not selected are the folios for the numerous patents that Edison received in countries other than the United States. No complete list exists, but the 1910 biography, Edison: His Life and Inventions by Frank L. Dyer and Thombot Commerford Martin, contains a compliation of 1,239 non-U.S. patents awarded in thirty-four countries. This list is also available on the TAEP website.

For Edison's successful applications, the selected material consists primarily of notes, drawings, and draft specifications in his hard, along with communications between Edison and his attorneys, including at various times Frank L. Dyer, Delos Holden, Henry Lanahan, and William A. Hardy. The case lites for Edison's abandoned applications have been selected in their entirety except for duplicates, printed patents by Edison's and other inventors, other printed material, and routine memoranda by Edison's attorneys. It should be noted that most of the folios contain copies of patents by other inventors that were cited by the Examiner as justification for rejecting the claims in Edison's applications.

In addition to Edison's own patents, these folios include applications by members of his laboratory staff, mainly for improvements in products such as the storage battery and the phonograph. These applications were also handled by Edison's patent attorneys. Documents from these folders have been selected only where they show Edison's personal involvement in the inventing or patenting processes. Folios with selected material include applications by Jonas W. Aytsworth (chemical compounds for phonograph records), Daniel Higham (kinteophone), and Miller Reses Hutchison (storage batteries). Several applications by Thomas A. Edison, Jr., pertaining to internal combustion engines have also been selected, along with another for a vending machine with a phonograph inside it.

The folios are arranged in chronological order according to execution date—the date on which the formal application was signed and witnessed. For Edison's successful applications, the selected documents within each folio

specifications, Patent Office correspondence, and other official documents appear in the order they are listed on the folio wrapper, followed by the other selected documents in chronological order.

On the list that follows, each selected folio appears with its execution date, folio number; patent number (for issued patents) or serial number (for abandoned applications); name of the primary applicant; and an abbreviated version of the patent title as it was issued (or, in the case of abandoned files, as found on the folio wrapper). Where the execution date is not available, the date of filing (which generally occurred a few days after execution) is supplied in brackets.

It should be noted that this is not a comprehensive list of Edison's patents for the period 1911-1931, since folios consisting entirely of unselected material do not appear. A complete list of Edison's 1,093 successful U.S. patents can be found on the TAEP website.

Exec. Date Follow Setr. or Pat. 19 Filmstry Appreciate 1/3/1911 682 Ser. 600762 Edison, Thomas A 1/3/1911 682 Ser. 600762 Edison, Thomas A 1/3/1911 682 Ser. 600762 Edison, Thomas A 1/3/1911 682 Pat. 1002505 Edison, Thomas A 1/3/1911 683 Pat. 1002505 Edison, Thomas A 1/3/1911 680 Pat. 1002505 Edison, Thomas A 1/3/1911 790 Pat. 1171/49 Edison, Thomas A 1/3/1911 791 Pat. 1204420 Edison, Thomas A 1/3/1911 791 Pat. 1204420 Edison, Thomas A 1/3/1911 792 Ser. 616757 Edison, Thomas A 1/3/1911 793 Ser. 616757 Edison, Thomas A 1/3/1911 793 Ser. 617675 Edison, Thomas A 1/3/1911 793 Pat. 1003505 Edison, Thomas A 1/3/1911 795 Pat. 1195050 Edison, Thomas A 1/3/1911 795 Pat.				Primary Applicant	Abbreviated Case File Title
1,031191 621 52. 52. 50.70782 52.	Exec. Date	Follo #	Ser. or Pat. #	Primary Applicant	Application described
1,01/1911 922 Ser. 600752 Edison, Thomas A Sound Reproducers 1,02/1911 691 Pal. 10,02050 Edison, Thomas A 1,02/1911 691 Pal. 10,02050 Edison, Thomas A 1,02/1911 691 Pal. 10,02050 Edison, Thomas A 1,02/1911 791 Pal. 10,02050 Edison, Thomas A 1,02/1911 791 Pal. 12,14833 Bilss, Donald M: A Annualis Class A) 2,02/1911 719 Pal. 12,1483 Bilss, Donald M: A Annualis Class A) 2,02/1911 720 Pal. 10,02050 Edison, Thomas A 2,02/1911 721 Ser. 61,1075 Edison, Thomas A 2,02/1911 722 Ser. 61,1675 Edison, Thomas A 2,02/1911 723 Pal. 10,02050 Edison, Thomas A 2,02/1911 724 Pal. 10,02050 Edison, Thomas A 2,02/1911 725 Pal. 11,05000 Edison, Thomas A 2,02/1911 725 Pal. 1	4004044	001	Ser 600761	Edison, Thomas A	Sound Reproducers
125/1911 688 Pail 1034002 Edison, Thomas A Slorage Ballery Incidence California Pail 1053535 Edison, Thomas A Slorage Ballery Incidence California Pail 1054004 Edison, Thomas A Slorage Ballery Incidence California Pail 1054004 Edison, Thomas A Slorage Ballery Incidence California Pail 1054004 Edison, Thomas A Slorage Ballery Pai					Sound Reproducers
1/25/1911 691 Pal. 10/33354 Edison, Thomas A Insulating Compound Composition for Sound-Records				Edison Thomas A	Storage Battery
1/25/1911 698				Edison Thomas A	Insulating Compound
12/15/19/11 088					Composition for Sound-Records
21/51/51 700 Ser. (05009) Edison, Thomas A 7 Talking Machines (Case A) 3/20/1911 719 Pal. 12/4829 Bilsis, Donald M Silson, Dand M Silso	1/25/1911	092	Fal. 1002000	Loison, manae .	•
21/51/51/7 700 Ser. 600009 Edison, Thomas A Talking Machines (Case A) 3/20/1911 719 Pal. 12/4838 Bilss, Donald M 20/20/51/7 719 Pal. 10/20/51 Pal. 12/4838 Bilss, Donald M 20/20/51/7 719 Pal. 10/20/51 Pal. 10/20/5	2/45/4011	808	Pat. 1187146	Holland, Newman H	Sound-Box for Phonograph
2019/11 715 Pai. 1214883 Bilss, Donald M 2019/11 715 Pai. 121483 Bilss, Donald M 2019/11 715 Pai. 121483 Bilss, Donald M 2019/11 715 Pai. 121483 Edison, Thomas A 2019/11 715 Pai. 121483 Edison, Thomas A 715/11 715 Pai. 107286 Edison, Thomas A 715/11 715 Pai. 107286 Edison, Thomas A 715/11 715 Pai. 107286 Edison, Thomas A 717/11 715 Pai. 108356 Edison, Thomas A 717/11 715 Pai. 108356 Edison, Thomas A 717/11 715 Pai. 106356 Edison, Thomas A 717/11 717 717/11 717 717/11				Edison, Thomas A	Talking Machines (Case A)
3/22/1911 719 Pai. 1204420 Edison, Thomas A Sound-Box Sound Sox				Bliss, Donald M	
3/22/1911 720 Ser. 616756 Edison, Thomas A Sound Boxes					Sound-Box
3/22/1911 721 Sar. 616757 Edison, Thomas A Processable: Telegraphs 728/1911 729 Sar. 616757 Edison, Thomas A 728/1911 729 728/1912 729/1912 729/				Edison, Thomas A	Sound Boxes
3/28/1911 722 257 c. 17574 Edison, Thomas A Talking Muchines (Case A) 3/28/1911 728 974 c. 17575 Edison, Thomas A Talking Muchines (Case A) 78/28/1911 728 974 c. 175728 Edison, Thomas A Talking Muchines (Case A) 78/28/1911 7	3/22/1911	120	001101010		
3/28/1911 722 Ser. 617674 Edison, Thomas A Talking Machines (Case A) 7/28/1911 728 Pat. 1072305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 728 Pat. 1072305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 729 Pat. 1073305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 729 Pat. 1073305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 729 Pat. 1073305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 7/28 Pat. 1073305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 7/28 Pat. 107305 Edison, Thomas A Talking Machines (Case A) 7/28/1911 7/28 Pat. 1050305 Edison, Thomas A Talking Machines (Case A) 7/28/1911	2/22/1011	721	Ser. 616757	Edison, Thomas A	Phonographic Telegraphs
3/28/1911 723 725			Ser. 617674	Edison, Thomas A	Talking Machines (Case A)
Adv/1911 728 Pal. 1078266 Edison, Thomas A Sound-Box Gallon Florage Gallon Florage Flo				Edison, Thomas A	Talking Machines (Case B)
4771911 731 Pat. 1167284 Edison, Thomas A Production of Nickel Hydrode Tomas A Tomas				Edison, Thomas A	
1732				Edison, Thomas A	Production of Nickel Hydroxid
4/71611 733 Pat. 1053355 Edison, Thomas A Forming Chemiked Compounds 51/1911 745 Pat. 1056205 Edison, Thomas A Forming Chemiked Compounds 51/21911 745 Pat. 1056205 Edison, Thomas A Pat. 105621 Edison, Thomas A Pat. 105621 Edison, Thomas A Pat. 11611 Fat. 11611 Edison, Thomas A Pat. 11611 Edison, Thoma	4///1011	731	1 44, 1107 101		
477/1911 733 Pat. 1093355 Edison, Thomas A Forming Chemical Compounds 71/1911 745 741. 1095205 Edison, Thomas A Separating Copper from Other Meetals 71/1911 745 Pat. 1056230 Edison, Thomas A Separating Copper from Other Meetals 71/1911 71/191	4/7/1011	732	Pat. 1083356	Edison, Thomas A	Storage Battery
5/1/1911 743 Pat. 1050629 Edison, Thomas A Separating Copper from Other Media's Pat. 105509 Edison, Thomas A Separating Copper from Other Media's Pat. 105509 Edison, Thomas A Separating Copper from Other Media's Pat. 1165101 Pat. 105521 Edison, Thomas A Reproducer Pat. 1165101 Edison, Thomas A Pat. 1165101 Edison			Pat. 1083355	Edison, Thomas A	Forming Chemical Compounds
5/12/1911 745 Pat. 1056930 Edison, Thomas A Separating Upoper from Unter Measures Felforth 6/16/1911 756 Pat. 1056931 Edison, Thomas A Reproducer 6/16/1911 756 Pat. 118191 Holland, Walter E 6/16/1911 757 Pat. 1181931 Holland, Walter E 6/16/1911 759 Pat. 1181630 Holland, Walter E 6/16/1911 759 Pat. 118630 Holland, Walter E 6/16/1911 759 Pat. 118630 Holland, Walter E			Pat. 1050629	Edison, Thomes A	Separating Copper from Other Metels
5/16/1911 748 Pat. 1055921 Edison, Thomas A Reproducer			Pat. 1050630	Edison, Thomas A	
Ref 1756 Pal. 1045201 Holland, Walter E Battery Charge Indication Ref				Edison, Thomas A	Reproducer
755 755 756 757	3/10/1011				
6/8/1911 755 Pat. 11/18114 Edison, Thomas A Making Motes for Sourin viscoles (14/19/1911 757 Pat. 11/16803 Holland, Walter E Valve for Storage Batteries (14/19/1911 759 Pat. 11/16893 Hulchison, Miller R Safety Device for Secondary Cells Control Striphing (14/19/1911 759 Pat. 11/16893 Hulchison, Miller R Control Striphing (14/19/1911 759 Pat. 11/16893 Hulchison, Miller R Control Striphing (14/19/1911 759 Pat. 11/16893 Hulchison, Miller R Control Striphing (14/1911 759 Pat. 11/16893 Hulchison)	6/6/1911	756			Battery Charge Indication
6/15/1911 757 Pat. 1165100 Holland, Walter E Valve for Storage Batteries 6/19/1911 759 Pat. 1116893 Hutchison, Miller R Salve for Secondary Cells Capacita Furniture			Pat. 1118114		Making Molds for Sound Records
6/19/1911 759 Pat. 1116893 Hutchison, Miller R Safety Device for Secondary Cells			Pat. 1165100		Valve for Storage Batteries
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mulati to			Ser. 639752	Edison, Thomas A	Concrete Furniture
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7/19/1911	767	Ser. 639716	Moore, Sherwood T	Phonographs
7/24/1911	770	Pat. 1016875	Edison, Thomas A	Electroplating Apparatus
8/1/1911	772	Ser. 642072	Edison, Thomas A	Storage Battery Motor Sets
8/1/1911	773	Ser. 642377	Edison, Thomas A	Sound Records and Making Same
[8/24/1911]	777	Ser. 645838	Kiefer, Herman E	Manufacture of Fertilizing Material
[8/24/1911]	111	301.043000	radion, ridinieni –	
9/26/1911	785	Ser. 651697	Hutchison, Miller R	Charging Secondary Cells
10/9/1911	794	Pat. 1204424	Gall, Adolph F	Kinetoscope
10/16/1911	801	Ser. 655902	Edison, Thomas A	Cement Kilns
11/29/1911	806	Pat. 1097985	Moore, Sherwood T	Forming Sound-Record Molds
12/12/1911	813	Pat. 1221981	Edison, Thomas A	Alternating-Current Rectifier
12/12/1911	013	, un innie		
12/19/1911	810	Pat. 1146413	Edison, Thomas A	Producing Tablets for Sound-Records
12/20/1911	812	Pat. 1275232	Edison, Thomas A	Production of Finely-Divided Metals
12/30/1911	818	Pat. 1073107	Edison, Thomas A	Storage Battery
1/2/1912	814	Ser. 669868	Edison, Thomas A	Method of Recording Sounds
1/2/1912	815	Pat. 1099349	Edison, Thomas A	Method of Making Sound-Record Molds
112/1912	010	1 00. 10000		
1/12/1912	819	Pat. 1143818	Edison, Thomas A	Charging Storage Batteries
1/19/1912	820	Pat. 1111999	Edison, Thomas A	Phonograph-Record
1/24/1912	821	Ser. 674274	Edison, Thomas A	Concrete Furniture
2/15/1912	825	Pat. 1190133	Edison, Thomas A	Means for Reducing Sounds
2/23/1912	826	Ser. 679744	Edison, Thomas A	Coatings for Storage Battery Containers
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2/28/1912	828	Ser. 681101	Edison, Thomas A	Storage Battery Systems
3/8/1912	829	Ser. 685206	Edison, Thomas A	Electrical Regulation
3/8/1912	831	Ser. 685542	Edison, Thomas A	Motor Vehicles
4/1/1912	833	Ser. 687967	Higham, Daniel	[Talking Pictures]
4/23/1912	845	Pat. 1167485	Edison, Thomas A	Storage Battery
4/20/10/12	0.10			
4/30/1912	846	Sar. 694658	Edison, Thomas A	Record Tablet Molds
5/20/1912	852	Pat. 1192400	Edison, Thomas A	Electrical System for Automobiles
5/21/1912	853	Pat. 1167638	Edison, Thomas A	Means for Concantrating Ores
6/14/1912	861	Ser. 704338	Langley, Sam G	Charging Storage Batleries
6/17/1912	860	Pat. 1282011	Aylsworth, Jonas W	Production of Sound-Records
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6/19/1912	866	Pat. 1266778	Edison, Thomas A	Making Screens for Projection
7/15/1912	870	Ser. 710150	Edison, Thomas A	Disc Sound Records
7/15/1912	871	Ser. 710151	Edison, Thomas A	Phonograph Recorders
7/22/1912	872	Pat. 1160585	Edison, T A, Jr	Internal Combustion Engines
7/27/1912	876	Pat. 1255517	Edison, Thomas A	Starting System for Automobiles
772771012				
8/9/1912	879	Pat, 1184334	Edison, Thomas A	Phonograph or Talking-Machina
8/21/1912	888	Ser. 719639	Edison, Thomas A	Phonographs or Talking Machines
10/24/1912	2 903	Ser. 728370	Edison, Thomas A	Illusion of Scenas in Colors
11/7/1912		Ser. 730343	Edison, Thomas A	Coating Phonograph Records
11/19/191:		Ser. 732410	Edison, Thomas A	Formation of Sound Records
10/10/1				
2/28/1913	915	Pat, 1286259		Means for Recording Sounds
2/28/1913		Ser. 752276	Edison, Thomas A	Phonographs or Talking Machines
3/27/1913		Ser. 757502	Higham, Daniel	[Talking Pictures]
4/10/1913		Ser. 760624	Edison, Thomas A	Molds
7/22/1913		Pat. 1182894	Chesler, Jerry	Alternating Current Rectifier

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Exec. Date				
9/3/1913	943	Pat. 1086727	Palmer, Harry B	Toy Guns
11/21/1913	952	Pat. 1290138	Edison, Thomas A	Friction-Speed Governor_
1/28/1914	964	Ser. 817976	Edison, Thomas A	Methods and Means for Treating Ores
1/31/1914	960	Ser. 815946	Hutchison, Miller R	Storage Batteries
2/3/1914	961	Ser. 816687	Edison, Thomas A	Sound Records
2/11/1914	965	Ser. 819301	Edison, T A, Jr	internal Combustion Engine
2/20/1914	971	Pat. 1162800	Nehr, William F	Phonographic Molding Apparatus
3/26/1914	975	Pat. 1130977	Hutchison, Miller R	Safety Device
4/21/1914	981	Pat. 1201449	Edison, Thomas A	Sound-Modifying Device
4/28/1914	983	Ser. 836608	Edison, Thomas A	Production of Molded Articles
4/20/1914	505	00.00000	Edition, members	
5/09/1914	985	Ser. 837706	Nehr, William F	Improvement in Molding Apparatus
5/22/1914	987	Pat. 1283779	Hutchison, Miller R	Storage Battery
5/28/1914	988	Pat. 1290254	Lewis, Frank D	Catch
7/10/1914	990	Pat. 1297466	Holland, Newman H	Speaking-Tube Support
7/10/1914	991	Pat. 1178014	Holland, Newman H	Phonograph
7/24/1914	993	Ser. 853283	Edison, Thomas A	Phonographs
8/6/1914	997	Pat. 1299693	Edison, Thomas A	Storage Battery
9/14/1914	1009	Pat. 1229749	Holland, Newman H	Phonograph
10/9/1914	1012	Pat. 1326330	Edison, Thomas A	Mold for Sound-Records
10/13/1914	1013	Pat 1266779	Edison, Thomas A	Electric Safety-Lantern
10/13/1914	1013			
8/21/1915	1030	Pat. 1342326	Edison, Thomas A	Matter for Sound-Records
1/11/1916	1038	Pat. 1297294	Edison, Thomas A	Projectile
1/12/1916	1037	Pat. 1323218	Edison, Thomas A	Rendition of Musical Compositions
2/4/1916	1041	Pat. 1300709	Edison, Thomas A	Projectile (Case A)
2/5/1916	1042	Pat. 1300708	Edison, Thomas A	Projectile (Case B)
5/18/1916	1045	Ser. 99281	Edison, Thomas A	Production of Potassium Chloride
9/21/1916	1048	Pat. 1283706	Edison, Thomas A	Para-Phenylene-Di-Amin Substances
	1049	Ser. 123480	Edison, Thomas A	Molds
9/28/1916		Ser. 134386	Edison, T.A. Jr	Internal Combustion Engines
[12/1/1916]	1053	Ser. 143017	Edison, Thomas A	Concrete Structures
1/16/1917	1058	Ser. 143017	Edison, Homas A	Condicto Guartares
1/16/1917	1059	Pat. 1266780	Edison, Thomas A	Storage Battery
8/15/1917	1081	Pat. 1353152	Dinwiddie, William W	Production of Molded Articles
10/23/1918	1104	Pat. 1425183	Edison, Thomas A	Transmitter
11/15/1918	1107	Ser. 262922	Knlerim, William H	Internal Combustion Engines
1/14/1919	1109	Pat. 1377192	Edison, Thomas A	Production of Molded Articles
3/3/1919	1115	Pat. 1452829	Edison, T.A., Jr	Internal-Combustion Engines
4/24/1919	1126	Pat. 1411425	Edison, Thomas A	Production of Molded Articles
4/24/1919 5/26/1919	1126	TM 128050	Edison, T.A. Jr	Trademark "Econometer"
	1129	Ser. 302556	Edison, Thomas A	Recording and Reproducing Sounds
5/27/1919	1129	Pat, 1371414	Edison, Thomas A	Nickel-Plating
6/12/1919	1130	FBL. 137 1414	Euroui, momas A	
6/18/1919	1131	Pat. 1359972	Edison, Thomas A	Electroplating
6/24/1919	1133	Pat. 1369271	Edison, Thomas A	Cleaning of Metallic Surfaces
8/28/1919	1139	Pat. 1402751	Edison, Thomas A	Storage-Battery Electrode
9/13/1919	1140	Pat. 1379088		Storage Battery
9/16/1919	1141	Ser. 324291	Edison, Thomas A	Production of Nickel

Exec. Date	Folio#	Ser. or Pat. #	Primary Applicant	Abbreviated Case File Title
9/24/1919	1142	Pat. 1364359	Edison, Thomas A	Protecting-Varnish for Electrodes
9/30/1919	1143	Pat. 1379089	Edison, Thomas A	Thin Metallic Sheets or Foils
11/3/1919	1144	Pat. 1386095	Edison, Thomas A	Gaivanic Batteries
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9/26/1921	1181	Pat. 1488480	Edison, Thomas A	Alkaline Storage-Battery Elements
072071021				
11/25/1921	1183	Ser. 518181	Edison, Thomas A	Electrolytically Deposited Surface Coatings
2/8/1922	1186	Pat. 1492023	Edison, Thomas A	Sound Record
6/23/1922	1196	Pat. 1678246	Edison, Thomas A	Production of Alkali-Metal Compounds
10/18/1922	1252	Pat. 1686686	Edison, T A, Jr	Ignition Timer
5/2/1923	1204	Pat. 1495580	Edison, Thomas A	Producing Chlorinated Rubber
5/11/1923	1205	Pat. 1651196	Edison, Thomas A	Storage Battery
6/28/1923	1209	Pat. 1600722	Edison, Thomas A	Mounting for Diamonds and the Like
12/7/1923	1212	Ser. 680332	Edison, Thomas A	Roofing
2/20/1924	1217	Pat. 1599121	Edison, Thomas A	Production of Depolarizing Agent
2/25/1924	1218	Pat. 1526326	Edison, Thomas A	Storage Battery
				Receiving Apparatus: Radio and Telephone
2/2/1925	1231	Pat. 1702935	Edison, Thomas A	Receiving Apparatus: Radio and Telephone
4/28/1925	1233	Pat. 1744533	Edison, Thomas A	Diaphragms of Sound Boxes Production of Molded Articles
1/25/1926	1239	Pat. 1744534	Edison, Thomas A	
2/1/1926	1241	Pat. 1711265	Edison, Thomas A	Phonograph Reproducer
10/1/1926	1248	Pat. 1690159	Edison, Thomas A	Producing Sound-Record Tablets
				Extraction of Rubber from Plants
11/25/1927	1268	Pat. 1740079	Edison, Thomas A	
1/9/1930	1333	Ser. 419780	Edison, T A, Jr	Phonographs

Patent Series

Patent Application Files

Folio # 681 Sound Reproducers

Serial #: 600761

Primary Applicant: Edison, Thomas A

Date Executed: 1/3/1911

Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. RDISON a citizen of the Cinited States, residing and having a Post Office address at Llowellyn Park, Wost Orango, Book County, Now Jersey,

prays that letters patent may be granted to him for the improvements in

SOUND REPRODUCERS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration Lo. 560), of Orange, New Tersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and annendments therein, to receive the patent, and to transact all business in the Patent Office connected thereinth.

Thomas 8. Edison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

EE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llowellyn Park, Yest Orange, Essex County, New Jersey, have invented certain new and useful improvements in SOUND REPROMORES, of shigh the following is a description:-

My invention relates to sound reproducers, particularly of the type adapted to reproduce from disc records having vertically undulating record grooves, although its use is not limited to that type. The object of my invention is to construct a reproducer giving an improved quality of reproduction, by the elimination of certain foreign or metallic sounds caused by the supporting means and connections commonly employed between the stylus and the disphragm, and by causing the otylus to track the record groove with great fidelity. Other objects of my invention will uppear from the following opecification and appended claims.

The lever or arm carrying the stylus and transmitting the measurements thereof to the displurage is commonly made of metal, and therefore may produce a characteristic wring" or metallic sound when set into vibration by the measurements of the stylus. I form this part of a material and in proportions so chosen that it will produce no

audible sound when the stylus is vibrated, the lever being preferably of wood. I also prefer to form the stylus-carrying arm between its pivot and the stylus with a portion stiffly resilient in a direction parallel to the movement of the stylus in tracking the record. With a vertically undulating record groove this construction has the effect of resisting movement of the stylus away from the record surface, which the mementum of the moving parts tends to produce in cases of vibrations of wide amplitude. In my construction the portion of the lever carrying the stylus and situated boyond the spring portion is of small mass and inertia, and upward movement of the stylus stresses the spring portion of the lever, which tends to hold the stylus always in contact with the record surface, while at the same time the spring portion of the lever is sufficiently stiff to transmit to the diaphragm all the vibrations of the lever due to the recorded sounds.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings, forming part of this specification, and illustrating the preferred form of my invention. In the drawing -

Figure 1 represents a central vertical section through a sound reproducer embodying my invention; and

Figure 2 represents an end elevation of the same looking from the left in Figure 1.

Referring to the drawings, the sound box $\underline{1}$ is formed in any suitable manner as by the annular member 2 and the flanged member $\underline{7}$ provided with the nock $\underline{4}$, the

threaded ring 2 being screwed into the annulus 2 to position and hold the members as shown. The diaphragm 6 is preferably secured between an annular rubber gasket 7 of circular cross section and a ring 2 preferably of steel, formed with a knife edge as shown, which is positioned to contact the edge of the diaphragm in a circular line opposite the center of the circular rubber gasket 7. A copper washer 2 may be interposed between the knife edge support 8 and the flange of member 2 as shown.

The stylus 10 is mounted in a suitable holder 11 carried by the end of lever 12 pivotally supported at 13. This lever or arm is formed of a material such that it will produce no audible sound when the stylus is vibrated, the lever preferably being made of well seasoned wood, the grain of which should preferably run in a diagonal direction, that is, preferably at an angle of approximately 45 degrees to the bottom surface 14 of the lever as shown. The upper end of the lever is secured to the center of the diaphragm in any suitable manner, as by the small bolt and nut 15, 16, and a suitable adhesive, as shellac. The lever is preferably pivoted to the ring 2 of the sound box by means of the small fixed pin 13 carried by a bracket 17, which is either secured to the ring 2 by sorews 18, as shown, or may be formed integral with the ring 2. The ends of pin 13 are mounted in lugs 19 carried by bracket 17. Lever 12 is provided with a suitable opening therethrough in which is driven a small sleeve 20 which furnishes a bearing for the lever when the same is mounted with pivot pin 13 extending through the sleave 20.

Lever 12 is provided with bosses 21 on each side of the ears, sleeve 20 extending only through these bosses. Lever 12 is preferably conserved or resuced in section as shown at 22, between pivot 13 and the stylus support 11 in order to make the lever stiffly resilient in the direction of movement of the stylus 10, that is, at right angles to the record surface.

By making the lever of wood the objectionable "ring" or metallic sound produced by a metallic lever or stylus arm in operation is eliminated, my improved stylus arm giving no audible sound of its own during the operation of the reproducer. Also, by providing the lever with the spring portion shown at 22, the stylus is caused to track the record groove with greater fidelity, and the quality of the sound reproduced is improved. In devices of this character commonly used, the momentum of the moving parts is often sufficient to cause the stylus to jump entirely clear of the record surface when a portion of the sound record representing a rarefaction of considerable amplitude is being reproduced. With my invention, the spring portion of the lever is put under a certain amount of stress when the stylus travele up the slope of a rising portion of the record groove, thus tending to hold the stylus in contact with the record surface and prevent the same from jumping therefrom, the portion of the lever between the end of the same and the concaved portion $\underline{22}$ being of small mass and having small inertia. While the lever bende somewhat in reproduction at ite most resilient portion as stated, neverthelese, the lever ie caused to rock upon ite pivot by the movements of the stylus in tracking the record groove, and the reproducing movements of the

stylue are transmitted to the diaphragm.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

- 1. In a cound reproducer, the combination with a disphragm and a sound box carrying the came, of a wooden lever pivoted to said sound box and connected to said disphragm, and a stylus carried thereby, substantially as described.
- 2. In a sound reproducer, the combination with a diaphragm and stylus, of means for supporting said stylus and transmitting the movements thereof to said diaphragm, computed entirely of wood, substantially as described.
- 3. In a sound reproducer, the combination with a disphragm and a stylus, of means for supporting said stylus and transmitting the movements thereof to said disphragm, so shaped and of such material as to be non-rosonant within the range of audible sounds, substantially as described.
 - 4. In a sound reproducer, the combination with a diaphragm and a stylue of means for supporting eaid stylus and transmitting the movements thereof to said diaphragm, composed entirely of non-metallic material, substantially as described.
 - In a sound reproducer, the combination with a diaphragm of a pivoted lever connected to said diaphragm and a stylus carried thereby, said lever being so shaped

and of material so chosen as to be incapable of vibrating so as to give forth an audible sound, substantially as described.

In a sound reproducer, the combination with a disphragm of a pivoted lever connected to said disphragm and a stylus carried thereby, said lever being formed with a portion between said stylus and the pivot of the lever stiffly resilient in a direction parallel to the reproducing movement of said stylus, substantially as described.

7. In a dound reproducer, the combination with a diaphragm and a stylus of a pivoted lever carrying said stylus and joined to said diaphragm and so formed in the portion thereof between its pivot and said stylus as to resist excessive movement of said stylus from the surface of a record being reproduced thereby, substantially as described.

In a sound reproducer, the combination with a sound box and a diaphragm positioned therein, of a lever pivoted to said sound box, and joined at one end to said diaphragm, and a stylus carried by the other end of said lever and mounted in position to track a vortically undulating record groove, the arm of said lever extending from the pivot thereof to said stylus being formed with a portion stiffly resilient in a direction parallel to the movement of said stylus in tracking said vortical undulations, substantially as described.

Que Na. Claims 3.4,5 6 6 + 3/2/12

This specification signed and witnessed this 3rd day of January 90'

Witnesses:

1 Depoi family

2 Dania R Mehrer

State of New Jersep Ss.,

Country of Essex

THOMAS A. EDISON , the above named petitioner, being duly sworn, deposes and says that he is a citien of the Amirko Halico, and a resident of Llowellyn Park, word Orange, Essex Country,

that he verily believes himself to be the original, first and sole inventor of the improvements in

SOUND REPRODUCERS

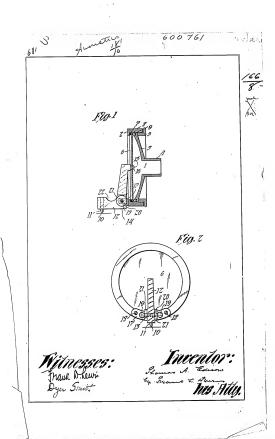
bescribed and claimed in the annexed specification; that he does not know and does not beliebe that the same was ever known or used before his inhention or biscovery thereof; or patented or described in any perinted publication in the Clinited Setates of America or any foreign country before his inhention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the Clinited Setates on an application filed more than twelve months prior to this application; or in public use or on sale in the Clinited Setates for more than two years prior to this application; and that no application for patent upon sale inhention has been filed by him or his legal representatives or assigns in any foreign country.

1				Notary P	
			Anna	R. Keehn	7
	Sworn to and	subscribed	before me this 3d		190/
			Thomas	8. Edin	

Form 170

Seal

New Jorsey



Div.23. Room379 "The Commissioner of Patents, Washington, D. Co"

J. F. D. -S.

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE WASHINGTON

Debruary 8, 1911.

Thomas A. Edison, Care Frank J. Dyer, Orango, New Jersey .

Edison Laboratory .

Please find below a communication from the EXAMINER in charge of your application. for Sound Reproducers, filed Jan. 4,1911, serial number 600,761 .

EBIUSOVE, Commissioner of Patenta

This application has been duly examined.

15 is not connected on the drawing.

The expressions, means composed entirely of wood, and moans composed entirely of mom-motallic material, in claims 2 and 4 respectively, are objectionable as not accurate. The supporting means include the entire sound box and the entire sound box is not of wood.

Claims 1, 2 and 4 are rejected as not patentable over McMahon, June 30,1891,#454,947, (181-10). It being old as here shown to make the reproducing bar of wood, no invention can be seen in alone making the common type of stylus har of wood.

Claim 3 is rejected on McMahon cited, see also Figure 6 in which the stylus ber is believed to be non-resonant.

Claim 5 is rejected upon the cited art. It is believed that applicant's stylus bur will not perform the function as broadly as claimed in this claim. Accordingly the claim is also rejected as covering a device inoperative to do that which is olaimed.

Claims 6 and 8 are rejected as not patentably distinguishing from Macdonold, July 25, 1905, #795, 293, (181-10). Any

#600,761----- 2.

stylus bar in which there is a out away portion and another particul between the pivotal point, the stylus bearing point will be stiffly resilient at that particular point.

Claim 7 is rejected upon the cited art and is also rejected as not distinguishing from almost any stylus her of the general type disclosed by applicant as French patent to Denzer, \$284,564,5pril 11,1908, (181-10). The Danzer patent: grevents excessive movement of the stylus from the surface of the record-

Div. _________379

J.H.D.+S. DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON

Doc. 1.1911 .

Thomas A. Edison, Care Frank L. Dyer, Orange, New Jersey U.S. PATENT OFFICE, DEC 1 1911 MAILED.

Care mdison Laboratory.

Please find below a communication from the EXAMINER in charge of your application.

for Sound Reproducers, filed Jan. 4,1911, serial number 600,761 .

BMSVIE, Commissioner of Polents.

This action is supplementary to the office action of Pobruary 8,1911 .

All of the claims are additionally rejected upon the disclosure by W. B. Stout in the Scientific American of April 27,1901 in an article entitled "How to make a Gramophone", wherein the stylus bar is made ontirely of wood.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
SOUND REPRODUCERS,)
Filed January 3, 1911
Sorial No. 600,761.)

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to Office action of December 1, 1911, please amend the above entitled case as follows:

Cancel claims 1, 2, 3, 4, 5 and 7 and change the numerals of claims 6 and 8 to 1 and 2 respectively.

In line 4, claim 1 (former claim 6) after "a" insert - Spring - .

In line 8, claim 2 (former claim 8) after "a" first cocurrence, insert - epring - .

Add the following claims:

- 3. In a sound reproducer, the combination with a diaphragm, of a pivoted lever connected to eaid diaphragm and a stylus carried thereby, said lever being formed with a yielding portion stiffly resilient in a direction parallel to the reproducing movement of said stylus, substantially as described.
- 4. In a sound reproducer, the combination with a disphragm of a pivoted wooden lever commoded to eaid disphragm and a ctylus carried thereby, eaid lever being formed with a yielding portion ctiffly resilient in a direction parallel to the reproducing movement of said

stylue, substantially as described.

- 5. In a sound reproducer, the combination with a disphragm, of a pivoted lever connected to said disphragm and a stylus carried thorsely, said lever being formed with a pertion of reduced cress section to render the same yielding and etiffly resilient in a direction parallel to the reproducing movement of said stylus, substantially as described.
- 6. In a sound reproducor, the combination with a diaphragm, of a pivoted weeden lever connected to said diaphragm and a stylus carried thereby, said lever being formed with a portion of reduced cross section to render the same yielding and stiffly resilient in a direction parallel to the reproducing movement of said stylus, substantially as described.

REMARKS

The Examiner is respectfully requested to connect the reference numeral <u>15</u> in Fig. 1 of the drawings with the belt coacting with the nut <u>16</u> to secure the upper end of the stylus lever to the disphragm.

Home of the references of record discloses a sound reproducer having a disphragm and a stylus lever connected to ead disphragm and formed with a yielding portion stiffly restlicate in a direction perallel to the reproducing movement of the stylus. In the patent to Macdonald of record, there is no reference to the construction of the stylus lever of a yielding material nor any

reference to the necessary form, proportions and dimensions of the stylus lever to render the same yielding and stiffly recilient. Evidently, the more provision of a "eut-away portion", as suggested by the Examinor, without the use of proper material and proper dimensions would not produce a stylus lever having the qualities specified above. Stout and Denzer clue do not disclose the yielding and stiffly resilient features of applicant's stylus lever. McMahonie device is of an entirely different character from applicant's device and is thought to have no bearing on the invention as now claimed. In none of the references of record is there any contemplation or appreciation of the structure claimed, nor of the advantages or improved results derived therefrom; and the claims are accordingly thought to be patentable.

Reconsideration and allowance are respectfully requested.

Orange, New Jersey, February 2, 1912. Respectfully submitted,

THOMAS A. EDISON

By Grand L. Ayer.

.g.3Room 379

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE WASHINGTON

March 4,1912.

Thomas A. Edison, Caro Frank L. Dyer, Orange, New Jersey .

MAILED

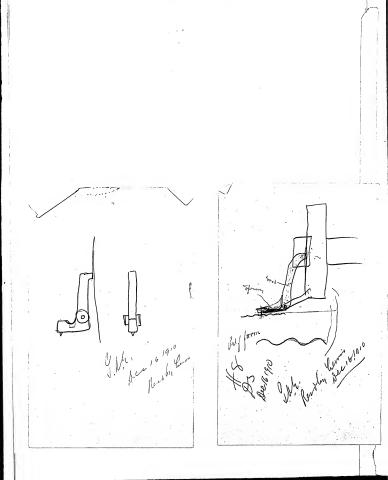
Please find below a communication from the EXAMINER in charge of your application. for Sound paproducers, filed Jan. 4,1911, serial number 600,761 .

EBMsore!

This action is responsive to the amondment filed Fob. 3,1912. Claims 1 and 2 are pojected upon French patent to Gwozdz, October 1,1909, #406,760,(181-11). It is believed that the reduced section below the bearing points will render the stylus bar stiffly resilient at that point although it may not be so described. In other words, it is believed that the cited structure will perform the function claimed by applicant .

Chains 3 and 5 are rejected upon Valiquet, June 4, 1907, #855 736, (181-11), soe 17; Martin, Dec. 8, 1908, #905, 899, (181-11), see 36, or Gleason, Aug. 11,,1908, #896, 806, (181-11), see especially 48. As to Martin or Valiquet, no invention is found in substituting a pivotal mounting for the mounting disclosed as a pivotal mounting for the stylus bar is one of the most common expedients in the art.

Claims 4 and 6 are rejected upon the art cited against claims 3 and 5. in view of the disclosure by Stout in the Scientific American of record. Invention is not found in making the cited stylus bars of material shown to bo old .



January 29, 1913

Meesrs. Bacon & Milans, 908 G Street, Washington, D. C.

Gentlemen:

Please escure for me as soon as possible, prints of the drawings in French patent to Gmozds, October 1, 1909, No. 406,700, and charge the cost of same to Thomas A. Edison, Incorporated, A. (Folio 681)

Very truly yours,

MJK

General Counsel

BACON & MILANS Comsellors at Tam

SOLICITORS IN PATENT AND TRADE-MARK CAUSES MCGILL BUILDING, 908 G STREET, NORTHWEST WASHINGTON, D. C.

February 1, 1913.

Delos Holden, Esq.,

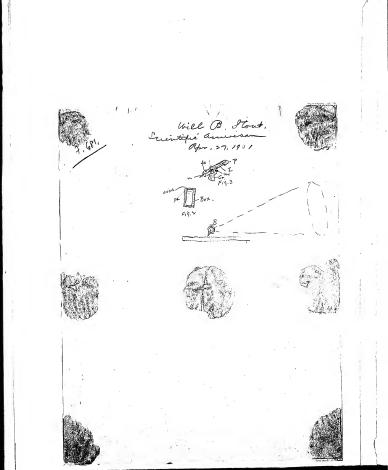
Orange, N. J.

near Sir:-

In keeing with the request contained in your favor of the 29th ult., we are enclosing herewith prints of French patent to Gwozdz No. 406,700.

ĸ.

Very truly yours,
Bacon Mulane



WILL B. STOUT SCIENTIFIC AMERICAN Apr. 27, 1901.

"The sound reproducing part consists principally of the "sounding box" and its lever and the horn. The box may be an old wooden pill box or may be cut from inch pine. It should be circular about an inch and a half in diameter, inside measurement, and an inch dcep. If cut of inch pine the central hole will be cut clear through the piece and a quarter inch backing, or bottom of the horn glued on a three quarter inch hole is drilled in one side of the box to receive the horn. To the front of the box is glued a thin diaphragm of isinglass, outside of which is glued a paper ring, or washer, as large as the rim of the box. The writer used one machino for a while, which had a tight paper diaphragm; but the isinglass is better. The box is shown in section in Fig. 2. The lever (Fig. 3) is cut out of hard wood in the shaps shown; the distance from the wire axle, wi, to the centre of the part,p, being the radius of the box outside. The other and of the lover is a trifls shorter than the inner end, and holds at its end, the needle, n, in a small awl hole. This needle is hold in place by a small screw . Sc, so that its projection from the wood may be adjusted till the clearest effect is produced. The lever is mounted in a erotch, Cr, cut also from hard wood, the axle, wi, being a wire. The crotch part is glued on to the side of the box at an angle of about 120 degrees with the hole already cat to

receive the horn, the part p, of the lever, being featened to the centre of the mice or isingless diaphragm with glue or scaling wax." * * * * * *

"while not up to the machine made product, yet it is not far behind, and for the satisfaction of the maker for the time spent in its manufacture, it 'can't be beat' ".

Patent Series Patent Application Files

Folio # 682 Sound Reproducers

Serial #: 600762

Primary Applicant: Edison, Thomas A

Date Executed: 1/3/1911

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	Applicant.		Address.
Thomas	A. Edison		
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Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON
a citizen of the United Setates, residing and having a Post Office address at
Llowellyn Park, Wost Orango, Essex County, New Jorney

prays that letters patent may be granted to him for the improvements in

SOUND REPRODUCERS

set forth in the annexed specification; and he hereby appoints Frank L. Ayer (Registration Lo. 560), of Orange, Arw Texsey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therebuth.

Thomas A. Edward.

SPRCIPICATION

TO ALL WHOM IT MAY CONCERN:

ME IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Lievellyn Park, West Grange, Essex County, New Jersey, have invented certain new and useful improvements in SOUND MERFRONCERS, of which the following is a description:

My invention relates to sound reproducers and my object is to provide means for climinating to a considerable extent the harsh and foreign noises which are usually heard during the reproduction by such devices from a record. In the operation of the reproducer, vibrations of the air are sot in motion by the movement of the front of the diaphragm as well as by the movement of the rear of the diaphragm which is connected to the horn or sound amplifier. The front of the diaphragm or that side to which the stylus is connected is usually open to the air and the sounds given off thereby should be stopped or prevented from passing through the air to the ear of the listener. I have determined that foreign and objectionable noises are made by the movement of the stylus lever upon its pivot and commonly by the vibration of the moving parts thomselves. Accordingly, in my invention I provide moans for enclosing the front of the diaphragm, and also preferably the pivot and the greater part of the

stylus arm or lever within a suitable closure or mufflor, which prevents the sounds referred to from setting up vibrations in the atmosphere. I preforably enclose the whole sound box in a metallic container of neat appearance, the stylus and a portion of its support extending through a small opening in the same. The container should be of a form and material so chosen as not itself to be capable of being set in vibration of a character to produce audible sounds. The objects of my invention in accordance with the foregoing statement are more fully disclosed in the following specification and appended claims.

In order that my invention may be more clearly understood, attention is horeby directed to the accompanying drawing, forming part of this opecification, and illustrating a preferred embodiment of my invention. In the drawings, Figure 1 represents a central vertical section through a sound reproducer provided with my invention, certain parts being shown in side elevation; and Figure 2 represents a section on line 2-2 of Figure 1, looking to the right.

The sound box 1 is provided with the usual diaphragm, to which vibrations are imparted by the stylus 2 carried by lover 2 pivoted as shown at 4 to the sound box 1, the upper ond of lever 2 being connected or fastened to the diaphragm in any usual or desired mannor. The closure 5 is preferably of brass and approximately spherical in form, onclosing the sound box 2, the upper arm of lever 2 and the pivot 4 thereof, the lower arm of the

lever extending downwardly through opening 6 adjacent the lower portion of the continer 5. The closure 5 may conveniently be made in two parts, the approximately homi-spherical portion Z which is integral with a short tube 8 adapted to be slipped over thencek of the reproducer as shown, and the homi-spherical portion 9 adapted to be joined to the portion ? to form the complete elemure. The connection may be made between the two parts by bonding the adjacent edges of the portions, as shown at 10, to form a spring fastening means. The parts may be located with respect to each other by means of a pin 2. secured to member $\underline{9}$ and inserted in a slot in member 7when the parts are brought together. By forming the closure as a continuous sphere or continuously arched member, vibrations of the same, such as might be produced by a metallic cylindrical closure having a plane surface parallel to the disphragm are prevented. Vibration of the closure would similarly be prevented if only the front portion 9 of the closure were used, the edges of the same being secured firmly to the sound box 1. I prefer, however, to use the form of closure illustrated, in which the sound box is entirely surrounded, and all sounds except those produced by the disphragm and transmitted therefrom through the neck 11 to the amplifying horn, muffled or eliminated. The sound box connection may be provided with the universal joint shown at 12 if desired, excessive movement of the reproducer in both a vortical plane and in a direction transverse to the record grooves being provented by the coaction of pin 13 secured to portion

Z of closure 5 with stirrup 14 carried by a member 15 secured to the horn connection 16, stirrup 14 preferably being formed with a triangular opening therethrough as shown.

Having now described my invention, what I claim and donire to protect by Letters Paient is as follows:-

- In a sound reproducer, the commination with a sound box, a dispirage carried thereby, a lever pivoted to said sound box and connected to said dispirage, and a stylus carried by said lever, of a substantially nonsound-transmitting closure mounted to cover the front side of said dispirage and a portion of said lever including the pivot thereof, substantially as described.
- the actual the transfer of the combination with a dispirate, stylus, and lover connecting the stylus to the dispirate, of a metallic closure mounted to cover the side of vaid dispiragm to which said stylus is connected and proveht the escape of sound vibrations therefrom, said closure being of such a form as to be subtantially incapable of being ost into vibrations corresponding to audithe sounds, substantially as described.
- 3. In a sound reproducer, the combination with a disphragm, stylus, and lever connecting the stylus to the disphragm; of a dubstantially non-sound-transmitting clocure in the form of a continuous arch, the ends of which are secured, mounted to cover the side of said disphragm to which said stylus is connected and prevent

the escape of sound vibrations therefrom, substantially as described.

In a sound reproducer, the continuation with a sound box, a disphragm carried thoreby, a lever pivoted to said sound box and connected to said disphragm, and a stylus carried by said lever, of a closure in the form of a continuous closed archientirely onclosing said sound box, the horn connection of said sound box and said stylus extensing out through said closure, substantially as described.

Querta - Celain 3. 126/12

This specification signed and witnessed this 3d day of annary 198 Thomas A. Edison Mitnesses: 1. Soper Rmith. Oath. State of New Jersey County of Essex THOMAS A. HDISON , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llowellyn Park, West Orange, Essex County, New Jersey that he berily believes himself to be the original, first and sole inventor of the improvements in SOURD REPRODUCERS. described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country. Sworn to and subscribed before me this 3 d day of Freemhen 90/ Anna P. Klehm Antary Bublic. [Seal]

2-200

J. W. D. -S. 68 DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Feby. 8,1911.

Thomas A. Edison, Care Frank L. Dyer, Orange, New Jorsey .

NT A 11 = D

Please flut below a communication from the EXAMIRER in charge of your application.
for Sound Penroducers, filed Jan. 4,1911, serial number 600,762.

Commissioner of Polenta

This application has been duly examined.

It being common in this art to enclose the disphragm stylus bar and mountings as in Runge, Sept. 25,1906, #631, 995, (201-11), no invention can be seen in making a container of spherical chape as in Gorman patent #187,705, Aug. 8,1907, (181-10) and all of the claims are accordingly rejected.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
SOUND REPRODUCERS,) Room No. 379
Filed January 4, 1911,)
Serial No. 600,762.)

HONORABLE COMMISSIONER OF PATRITS,

SIR:

In response to Office action of February 8, 1911, please amend the above entitled case as follows: Cancel claims 2 and 3 and change the numeral of claim 4 to 2.

Add the following as claim 3.

3. In a sound reproducer, the combination with a sound box, a disphragm corried thereby, a lever pivoted to said sound box and connected to said disphragm, and a stylus corried by said lever, of a substantially non-sound transmitting closure in the form of a continuous closed arch entirely enclosing said sound box and also enclosing a portion of said lever including the pivot thereof, the horn connection of said sound box and said stylus extending out through said closure, substantially as described.

REMARKS

The Examiner is respectfully requested to change the reference character designating the pin co-acting with the stirrup 14 from 3 to 18 in both of the figures.

Claims 1 and 2 are thought to be allowable in their original form and have, therefore, not been amonded. Claim 1 differentiates from the patents of record by specifying "a substantially non-sound transmitting closuro mounted to cover the front side of said disphragm and a portion of said lever including the pivot theroof". Roforring to the patent to Runge, the function of the cover 7 disclosed therein is/to prevent transmission of sound from the front of the diaphragm and the stylus lever pivots but to provent disturbance of the device by an accidental blow and to shut out dust and dirt. See lines 97 to 101, page 1 of Runge's specification. The material of which the cover is made is not specified by Runge; and considering his invention as disclosed, a material capable of vibrating and accordingly of transmitting sounds might be employed. In the German patent of record, reference to the material of which the member \underline{c} is made is likewise omitted and the stylus lever is not supported on pivots within the said member c.

claims 2 and 3 specify that the enclosure entirely encloses the sound box. In neither of the patents of record is the rear of the sound box enclosed; and the vibrations emanating from this part of the sound box are accordingly free to be transmitted to the ears. In spplicant's device, this objection is obvicted by entirely enclosing the sound box.

The now claim which is presented herewith sets forth that the entire sound box and also a portion of the stylus here: including the pivot thereof is enclosed by a substantially non-sound transmitting closure in the form of a continuous closed erch, features which, as set forth above are not disclosed in the references of record.

Reconsideration and allowance are respectfully

requested.

Rospectfully submitted,

Orange, New Jersey, January 26, 1912.

THOMAS'A. EDISON,

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON ... March 1,1912.

Thomas A. Rainon, Caro Frank L. Dyor, Orange, New Jorsey U.S. PATE*T OFFICE,

MAR 1 1912

MI AIL ED.

Please find below a communication from the EXAMINER in charge of your application.

for Sound geproducers, filed Jap. 4,1911, certal number GDO, NGS .

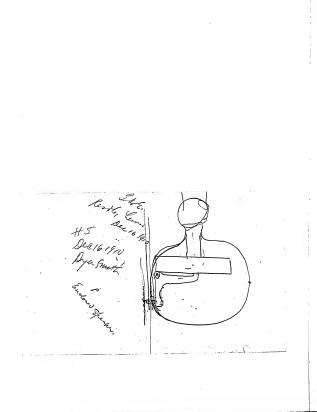
EBMSore,

This action is responsive to the spendment filed Jan. 27.

As applicant's constructs his caning of retal, an excellent sound transmitting means, he must depend on the form of his casting rather than on the material thereof to provide a non sound transmitting easing. This is further borne out by the context of the specification. This being true, the the German dovice is operative to perferm this function if applicant's structure is. Note that the German returence has a complete sound box inside of his spherical easing except that the stylus bur is supported from the enter easing instead of from the inner. Invention is not seen to be involved in alone supporting the German stylus bur from the inner casing, especially in view that it is old to provide the stylus bur mounting inside of a eaging as in Runge of record or Johnson, Sept. 13, 1904, #709,609, (181-5). Accordingly all of the claims are

Claim 1 is also rejected on Johnson alone. Moreover, non sound transmitting capings are old as in Johnson cited; Robinson, Dec. 27, 1504, #776,271, (181-3), or Bettini, non. 20, 1892, #486, 379, (181-10) and invention is not found in making such

In the structure of Jacques, May 28, 1888, #885, 259, (181-2), the sound box is enclosed in a non sound transmitting casing. In stream patent #215, 1805, July 15, 1805, (181-3), the sound box is entirely enclosed in a casing that will oxclude the sound. Invention is not found over those two structures in applicant's structure and the claims are additionally rejected for such reasons. Furthermore, Hountyleb. 28, 1910, \$649, 959, (181-3), discloses the isolation of the sound rising on one side of the disphraga from that rising on the other side. Stote that in this structure the stylus bar mounting is inside of the casing. While Mount — conducts the same from both sides of the disphraga to the care. In view of the references of record, invention is not found in completing the caseloure provided for the outer side of the disphraga. Accordingly all of the slaims are additionally rejected for such reason.



L R HACON JOSEPH IL MILANS CALVIN T. MILANS THOMAS IL HEATH GEORGE D. HILMY CARLE ADDRESS

BACON & MILANS

LONG DISTANCE TRANSPIONE MAIN 1808

SOLICITORS IN PATENT AND TRADE-MARK CAUSES MCGILL BUILDING, 908 G STREET, NORTHWEST WASHINGTON, D. C.

Dec. 30, 1910.

Dyer Smith, Eso., Orange, J. J

Dear Sir:

follows:-

Referring to your favor of the 29th inst., we beg to advise you that we have made title searches of the patents referred to in your letter and have to report as

Apple, 932,087:-

We have to report that we have been unable to find any instruments of record afrecting the title to this gatent up to and including Dec. 15, 1910, the last date of record on the againment digest.

Robinson, 778,271:-

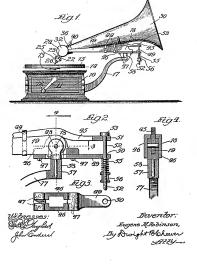
We have made a careful search through the assignment records with reference to this patent and have found but one assignment of record affecting the title thereto, makely, an assignment from Eugene M. Robinson to Eudolph-Wublitzer Co., corporation of Ohio, Cincinnati, O., assigning all the right, title and interest in patents Nos. 778,271, 813,670, and 831,188, and all rights of recovery for past infringements thereof by third parties. This assignment was acknowledged Sept. 20, 1908, and recorded Jan. 6, 1907, in Liber V, 78, page 273.

No. 778,271.

PATENTED DEC. 27, 1904.

E. M. ROBINSON
PHONOGRAPH.
APPLICATION FILED WAY 12, 1604.

2 SHILLTS-SHELL 1.



Dec. 22, 191

Mr. Dyer:-

Mr. Edinon is desirous of mounting a closure over the front of the reproducer, as shown in the patent drawing which I hand you herewith, to smother the sounds given off by the front of the disphragm. A device dominating this is shown in patent to Robinson, No. 778,271, Dec. 27, 1904 herewith. The only substantial difference is that Robinson makes his enclosing cap 32 of cardboard or other non-sound-transmitting material and cylindrical in form, while Mr. Edison makes his of brass preferably, and rounds it out as illustrated to prevent vibration of the same. I think Robinson's Claim 2 is infringed by this device, and would recommend that we attempt to buy Robinson's patent if Mr. Edison wishes to use the device in the machine to be manufactured.

D. S. 5mm

DS-JS

1638...

MEMORANDUM

PRANK L. DYER.

Mr. Smith:

12/23/10.

Referring to your note of the 22nd inst., I hardly think it worth while to attempt to buy the patent to Robinson for the following reasons:

1. It has not been definitely decided to enclose the open side of the speaker as Mr. Edison proposes. When that has been definitely decided the question of buying the Robinson patent oan he considered.

2. I do not think Mr. Edison's suggestion infringes the Robinson patent. Robinson slides his cap over the body of the speaker and holds it in place frictionally. Both the

n.S.-2

second and third claims are limited to the fact that the cap is "adapted to slidsbly fit over and covor one side of the reproducer of the phonograph". Mr. Edison's dovice is simply a spherical containing box entirely surrounding the reproducer and not fitted to it; this strikes me as being a different invention.

3. The idea of muffling the sounds doveloped at the open side of the diaphragm is very old, and I think you will find a number of Edison patents disclosing this. Perhaps there are other patents. The suggestion has often been developed in the Laboratory and is one of the common thoughts of the phonograph business. No doubt Mr. Pierman or Fred Ott oan give you a good deal of information on this point.

FLD/IWW

Patent Series

Patent Application Files

Folio # 688 Storage Battery

U.S. Patent #: 1034002

Primary Applicant: Edison, Thomas A

Date Executed: 1/25/1911

Me Iger Smith

Dear Sir:

On reference to own convexation
of yesterday neon, about Neikelhydroxides I bug to obter that.

Me Edicor wishes to feak the matter
over with your before I zowe you the
necessary in furnation
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12/29/10.

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Patent Series Patent Application Files

Folio # 691 Insulating Compound

U.S. Patent #: 1083354

Primary Applicant: Edison, Thomas A

Date Executed: 1/25/1911

Writter by Mr. Edien in My present a about Jamony by 1911. Dyel Fresht Gam. 2919.

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of Jecrosup Campball

Patent Series

Patent Application Files

Folio # 692 Composition for Sound-Records and Other Objects

U.S. Patent #: 1002505

Primary Applicant: Edison, Thomas A

Date Executed: 1/25/1911

Received Oyer Smith December 1911.

Mixture of Sheller of Tetrachlormophthalenia, with very Lenely oprocessed

Coborton)

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D. S. Mr. Edison works of now to proceed with the water. J. h. Dy an

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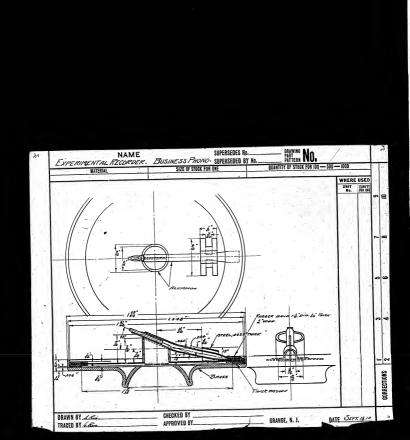
Patent Series Patent Application Files

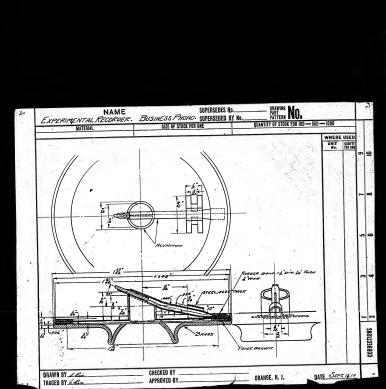
Folio # 698 Sound-Box for Phonograph

U.S. Patent #: 1187146

Primary Applicant: Holland, Newman H

Date Executed: 2/15/1911





Patent Series Patent Application Files

Folio # 700 Talking Machines (Case A)

Serial #: 609099

Primary Applicant: Edison, Thomas A

Date Executed: 2/15/1911

Applicant	. 777 		Address.	. (
Applicant Thomas A E Llew M	ellin Park			
21	629			
Itle Falking	machine	(a)		
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Hed February 17	1,1911.	Examiner	s Room No	
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Assignee				
Ass'g't Exec.				
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Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON, a citizen of the United States, residing and having a Post Office address at Llewellyn Park, Wost Orange, County of Tweez, State of Now Jersey

prays that letters patent may be granted to him for the improvements in

- TALKING MACHINES -

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration Lo. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make afterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas . Y. Eduson

SP ECIFICATION.

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New Jersey, have made a certain new and useful invention in TALKING MGHINTES, of which the following is a description:

My invention relates to talking machines and more particularly to means for holding the sound record employed with such machines against rotation with reference to its support.

It has heretofore been oustomary in machines in which a record of disc form was supported on a rotatable support to rely upon the friction between the record and support to prevent relative rotary movement between these parts. When, however, a reproducer of considerable weight is used with such machines, it is found that this friction is not sufficient to prevent such relative movement and that the reproduction is accordingly imperfect. It is the object of my invention to obviate this objection by the prevision of means for positively locking the record to its support.

With this and other objects in view, my invention consists of the features hereinafter set forth and claimed.

In order that my invention may be more fully understood, atten tion is hereby directed to the accompany-

ing drawing forming a part of this specification and in which -

Figure 1 represents a central, vertical sectional view of a portion of a talking machine embodying one form of my invention, some of the parts being shown in elevation.

Figure 2 represente a plan riew thereof; Figure 3 represents a central, vertical sectional view of a device embodying a modified form of my invention and

Figure 4 represents a plan view thereof.

In all of the views corresponding parts are designated by the same reference numerals.

Referring to Figures 1 and 2, 1 represents the top of the cabinet of a talking machine in which is rotatably mounted the shaft 2 for driving the table 3, which is adapted to support a sound record 4. 5 represents a pin or equivalent means for securing the table 3 to the shaft 2. The upper end 6 of the shaft projects above the table and is adapted to engage the central aperture 7 in the record and thue to form a bearing for the record.

In order to prevent relative rotation between the record and the shaft $\underline{2}$, the end $\underline{6}$ of the latter 1e provided with a key or equivalent meane $\underline{8}$ preferably engaging in a slot or key way $\underline{9}$ in the record. In the form of my invention shown in Figures 1 and 2, thie key is solid with the shaft $\underline{2}$. In the modification shown in Figures 3 and 4, the key is clidable radially of the shaft and record in the recees $\underline{10}$ in the shaft $\underline{2}$ and is

forced into engagement with the record by a spring or equivalent yielding means 11. While the key in this modification is shown as co-operating with a keyway, obviously this modification could be used with records not provided with a key way. In the latter case, the key would be forced into the recees 10 and would be held by the epring 11 in firm frictional engagement with the wall of the sperture 7 in the record. As shown in Figure 3, the key 8 co-operates with a key way 12 in the table 2 to lock the latter to the shaft 2.

Having now described my invention, what I claim as new and desire to secure by Letters Patent of the United States is as follows:

- In a talking manhine, the combination of a record support, a record cupport, a record curried thereby, and a rotatable driving shaft secured to said support and forming a bearing for said record, said shaft and record being provided with means for positively locking the same against relative rotation, substantially as described.
- 2. In a talking machino, the combination of a record support, a record currical thorsby, and a re tatable driving shaft secured to said support and forming a bearing for said record, add shaft and record being provided with interfitting means for positively locking the sure against relative rotation, substantially as described.
- In a talking machine, the combination of a record support, a record carried thereby, and a rotatable driving chaft secured to caid support and forming a bearing

for said record, said shaft and record being provided with a key and slot connection for looking the same against relative rotation, substantially as described.

- a. In a talking machine, the combination of a record support, a rotatable driving shaft secured to said support and forming a bearing for the record, a key mounted in said shaft and means for forcing the said key into engagement with the record to lock the same against rotation with respect to said shaft, substantially as described.
- 5. In a talking machine, the combination of a record support, a rotatable driving shaft secured to said support and forming a hearing for the record, a key mounted in said shaft, and yielding means for forcing the said key into engagement with the record to look the same against rotation with respect to said shaft, substantially as described.
- b. In a talking machine, the combination of a record support, a rotatable driving shaft secured to said support and forming at its upper end a bearing for the record, (the said upper end of the shaft being provided with a recess, and a spring pressed key slidably mounted in said recess, and adapted to lock the record against rotation with reepect to said shaft, substantially as described.

dutie in in - while

This specification signed and witnessed this 15 day of tehrnay 1911

Thomas A. Educon

Witnesseth:

1. Tracish Backmann

2. Anna P. Keehm

Oath.

State of New Jersey Ss.,

THOMAS A. KDISON , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the Cluited States, and a resident of Llowellyn Park, Vost Orango, New Jersey

that he berily believes himself to be the original, first and sole inventor of the improbements in TALXING MACHINES

described and claimed in the annexed specification; that he does not know and boes not beliebe that the same was ever known or used before his invention or obscrobery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two gears prior to this application; or patented in any country foreign to the United States on an application tiled more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon sale indention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before the this 15 hay of Internated 1917

ANNA RECEIVED STATE OF THE VICTORIES OF T

[Seal]

Notary Public.

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Paper No.---2--Re 1.
All communications respecting this plication should give the of inventors

DEPARTMENT OF THE INTERIOR

700

UNITED STATES PATENT OFFICE

WASHINGTON

Thomas A. Edison, Care Frank L. Dyor, Orange, New Jersey . March 15, 1911

Please find below a communication from the EXAMINER in charge of your application.

for Talking Machines, filed web. 17,1911, serial number 609,099 .

Commissioner of Patents.

. This application has been duly examined .

Claims 1, 2 and 3 are rejected upon either Tainter, July 10,1888, #385,887; Noffman, Nov. 12,1807, #870,961, or Milens, October 2,1966, #832,407, all in (181-17).

Claims 4, 5 and 6 are rejected upon the cited art, in view of Valquet, Zen. 17,1905, #750,246, (181-3). No invention om he found in making the Senter pont key spring pressed in view that a key spring pressed to retain the record upon the table is an old expedient in this art. IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,

TALKING MACHINES,
Filed February 17, 1911,

Serial No. 609,099.

HONORABLE COMMISSIONER OF PATRICTS,

SIR:

In response to Office action of Murch 15, 1911, please emend the above entitled case as follows: Cancel claims 1, 2 and 3 and renumber claims 4, 5 and 6 as 1, 2 and 3.

Add the following as claim 4:

4. In a talking machine, the combination of a record support, a rotatable driving shaft secured to said support and forming at its uppor end a bearing for the record, the said upper end of the shaft being provided with a recess, a key mounted in said recess and movable to a position entirely within the same, and a spring tending to force said key out of said recess and into engagement with the record, substantially as described.

REMARKS

None of the references of record discloses a key mounted in the driving shaft of the record support and means for forcing the said key into engagement with the record to lock the same against rotation with respect to said shaft. The Examiner states that "No invention can be found in making the contor post key spring pressed in view that a key spring pressed to retain the record upon the table is an old expedient in this art", the last

part of this cuotation evidently reforring to the disclosure of the patent to Valiquet. Reforring to the patent to Valiquot, the spring pressed pin disclosed therein is not mounted in the driving shaft, as called for by the olaims, but is located a considerable distance to one side of the same. Such a construction is not only less simple than that set forth in the applicant's claims, but requires a specially formed record tablet having a recess or opening which must always be located a fixed distance from the center of the record. Bocause of expansion and contraction of the record due to temperature changes, the distance between the center of the record and the said recess or opening undergoes an appreciable change. It is not seen how Valiquet's construction could suggest that set forth in any of applicant's claims; and in view of the simplicity and obvious advantage of the latter construction over prior constructions, it is thought that the claims are patentablo.

How claim 4 distinguishes from the references of record for the reasons set forth above and also by specifying that the key is movable to a position entirely within the slot in the driving short. By reason of this construction, the applicant's locking means may be used with records with or without a slot leading from the center aperture and is, therefore, of general application. No such construction is either shown or suggested by the references of record.

Reconsideration and allowance are accordingly respectfully requested.

Respectfully submitted,

Orange, New Jorsey, February 24, 1912.

By Frank L. Dype.

his attorney.

Div. ...23... Room379

Address only
"The Commissions of Patents,
Washington, D. C."

J. H. D. = S.

2-250

Paper No. Pod.
All communications respecting this application should give the serial number, date of tilling, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Waroh 27,1912.

Thomas A. Edison, 7 6-0

Care Frank L. Dyer,
Orange, New Jersey

U.S. PATENT OFFICE, MAR 2/1912 MAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Talking Machines, filed pob. 17,1911, eerial number 609,099 .

EBILISOTE .

This action is responsive to the amendment filed Peb. 26, 1912.

All of the claims are rejected upon Hoffman of record or Tainter, July 10,1888,#388,886, (161-3),see 43, in view of Sweet,qopt. 10,1901,#582,507, (74-Gearing,Sildable Key.) Invention ie not found in making the keys of Tainter or Hoffman epring pressed in view of Sweet's structure. It is not seen that any function has been obtained but what is obvious from the employment of a spring pressed key in the talking muchine structuresofted.

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Patent Series

Patent Application Files

Folio # 715 Alternating Current Motor

U.S. Patent #: 1214883

Primary Applicant: Bliss, Donald M

Date Executed: 3/10/1911

M Lana Rans

Mr. Edison:-

Therewas had been get the big box of the box

FOLIO 715 - application of Donald M. Blise Alternating Current Motors

This application covers a combined induction and repulsion motor designed to operate on a single phase circuit and
self-starting. I understand that we do not use this motor.
This application is one of a group of applications assigned to
Thomas A. Edison, Inc. which you decided to prescente and make a
reasonable effort to secure the allowance of the claims because of
the agreement with Mr. Bliss. The interest of Mr. Bliss in this
application or a patent granted on it is that if the we sell the
application or patent, or grant a license, Mr. Bliss is entitled
to receive 25% of all moneys or other consideration received by us
from such sale or as royalties under such licenses.

We have been able to secure the allowance of the skilow ing claims:-

having openings located near the periphery thereof a squirrel logge system of conductors located in the formular constitution, and a communical winding located in the remainder of the openings, substantially as described.

2. An armature comprising a core of magnetic material having two sate of alternately arranged axially sected into positions are the partibery thereof and substantially scutdistant therefrom, a closed circuited winding in one of said sets of openings and a commutated winding in the other of said sets, substantially as described.

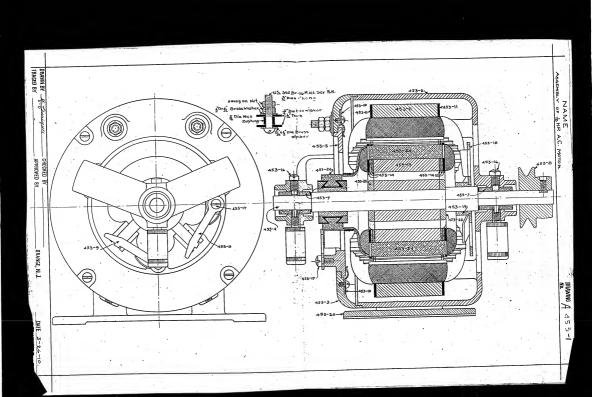
4. In alternating current motor comprising a state and a person of of said members being provided within a dark stending slots, and having a commutated and a comprising slots, and sort sircuited conductors located between said slots, and sort sircuited conductors located between said slots, substantially as described.

The following claims have been rejected:

- In an alternating current motor, a rotor comprising a cors of magnetic material, a completely closed-circuited squirrsl cage winding and a commutated winding located near the periphery of the said core, each winding being uniformly distributed around the core and with portions of each winding between portions of the other winding, and a commutator and short circuited bruehes for the commutated winding, cubstantially as described.
- In an alternating current motor, a rotor comprising a core of magnetic material, a completely closed-circuited squirrel cage winding and a commutated winding, the active conductors of both being located near the periphery of the said core and substantially equidistant from the axis thereof, each winding being uniformly distributed around the core and the two windings being so related that eubstantially all of the flux threading any coil of the commutated winding threads also a closed-circuited portion of the squirrel cage winding, substantially as described.

These claime are rejected on the patent to Arnold No. 562,365, see particularly the diagrammatic shown in Fig. 4, the Examiner holding that the short circuited windings at shown in this figure are the squivalent of the chert circuited squirrel cags winding smployed in the Bliss motor and recited in the claims. While it is doubtful whather the Examiner is correct in this position, it would seem that the invention is a narrow one in view of the Arnold patent and the patent to Bretch No. 848,719, and that the Office has allowed us reasonably good claims. The question now is whather you wish an appeal taken against the final rejection of claims 3 and 5, or whather we shall cancel these claims and taks out the patent.

Donald M. Blus President of the Engineery Steam Stampare, from Dec 1908 I San A. Longly Electrical Edgmen and Separatement dung some found. as early - Feb 1909, moster was If under langley's durition in accordance with Bliso's motivation first boundary andering of first maters all . His mute was delimed after Ay 2, 409 to Peters + Peters, y Naw york.



Because from D. M. Blio, Dec 3, 1940.

Brush Shifting

Patent Series

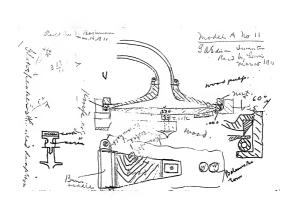
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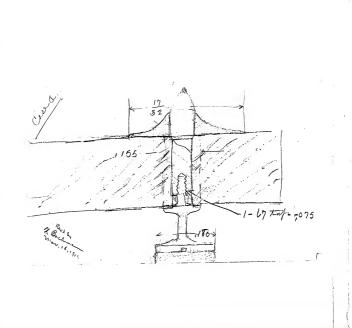
Folio # 719 Sound-Box

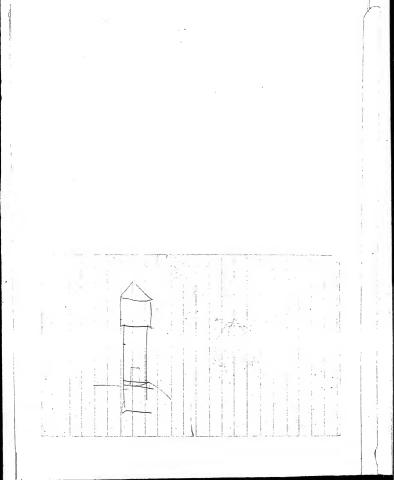
U.S. Patent #: 1204420

Primary Applicant: Edison, Thomas A

Date Executed: 3/22/1911







Patent Series

Patent Application Files

Folio # 720 Sound Boxes

Serial #: 616756

Primary Applicant: Edison, Thomas A

Date Executed: 3/22/1911

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FRANK L. DYER,

Counsel,

Orange, New Jersey.

Zear Pa.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON, a citizen of the United States, residing and hading a Post Office address at Llewellyn Park, West Orange, Benex County, New Jersey,

prays that letters patent may be granted to him for the improbements in

SOURD BOXES

set forth in the annexed specification; and he hereby appoints Frank E. Wyer (Registration No. 560), of Grange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewish.

Thomas & Edison_

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN;

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New yersey, have invented certain new and useful improvements in SOUND BOXES of which the following is a description:

Wy invention relates to sound boxes particularly of the type adapted for use in connection with disc records having vertically undulating grooves, although its use is not limited to that type. The principal object of my invention is to construct a reproducer giving an improved quality of reproduction by the elimination of minute scratch vibrations and by the reduction of the prominence of objectionable high or low notes. Another object of my invention is to provide a construction whereby the loudness of the reproduction is materially increased; and it is in this feature that the principal difference between the present invention and that disclosed in my application. Serial No. 646, 785 filed As in the last named invention I insert between the stylus arm and the diaphragm, a yielding non-metallic member of short elasticity preferably of cork, to absorb the scratch vibrations. In order to obtain a loud reproduction and at the same time to balance up the tone of the disphragm. I connect the stylus arm with the diaphragm eccentrically of the latter, as will be more

fully explained in the following specification. I also prefer to make the stylus arm of wood or other suitable non-metallic substance so as to eliminate the characteristic "ring" or metallic sound which is produced when the common metallic stylus arm is set into vibration.

Other objects of my invention will appear more fully from the following epecification and appended claims.

In order that my invention may be more clearly understood, attention is hereby directed to the accompanying drawing forming a part of this specification and illustrating a preferred form of my invention.

In the drawing,

Figure 1 represents a central vertical section through a sound reproducer embodying my invention;

Figure 2 represents a bottom plan view thereof;

Figure 3 represents a diagrammatic view showing how the tone of the diaphragm is balanced by my improved construction.

In all the views, like parts are designated by the same reference numerals.

Referring to the drawings, the body of the reproducer is formed in any suitable manner as by the flat motallic, conical member 1 having secured thereto a hollow neck 2, bent substantially at a right angle, the flanged annulus 3, and the threaded ring 4 screwed into the annulus 3 to position and hold the members as shown. The disphragm 5 is preferably sourced between rabbur an annular graded of circular cross section and a ring 7 preferably of steel formed with a knife edge, as shown,

which is positioned to contact the edge of the diaphragm in a circular line opposite the centre of the annular gacket §. By reason of this construction, the diaphragm is permitted to bend on the gasket § and ring 7 without buckling. I preferably form the diaphragm § of wood pulp board making the inner face thereof plane and the outer face thereof, except for a short distance from the periphery, convex; so that the diaphragm has substantially the form of a segment of a sphere. This form gives to the diaphragm increased rigidity towards the centre and eliminates objectionable local vibration.

The stylus arm 8 which is preferably made of, wood, is rigidly secured to the member 3 by a bracket or saddle 9 held in place on the horizontal flange 3' of the member 3 by screws or other fastening means 10. A strip 11 of metal or other suitable material is interposed between the stylus arm and the flange 3' so as to space the said arm a proper distance from the diaphragm and is held in place by the bracket 9.

The stylus arm 8 extends substantially parallel to the diaphragm, and, at its outer end, which extends some distance beyond the centre of the diaphragm, supports a member 12 between which and the diaphragm is interposed a piece 13 of cork or other yielding non-metallio material of short elasticity. The cork 13 is preferably secured by shellac or other suitable adhesive to the member 12 and the diaphragm. The stylus 14, which is preferably a diamond, is mounted in a holder 15 which is provided with a shank 16, secured in any suitable way to the stylus arm, preferably in a position to locate the stylus 14 substantially under the centre of the diaphragm. The stylus stantially under the centre of the diaphragm.

arm being connected to the diaphragm eccentrically of the latter, the distance from the point of application of the forces tending to vibrate the diaphragm to the various points on the periphery of the diaphragm varies as shown in Figure 3. The result of this construction is that the diaphragm is not in tune with any particular note and that, therefore, a well balanced tone is obtained. Furthermore, by reason of the connection of the stylus arm to the diaphragm eccentrically of the latter, the movements of the centre of the diaphragm are magnified as will be evident; so that a reproduction of increased loudness is obtained. The magnification of the vibrations of the diaphragm may also be increased by locating the stylus 14 intermediate the connection 12, 13 and the fixed end of the arm 8, as shown. By reason of the employment of the cork insert 13, a large amount of minute soratch vibrations ordinarily emitted when the stylus is tracking a record are absorbed; and by making the arm 8 of wood the objectionable "ring" which is emitted by the common form of metallic stylus arm during its vibration is eliminated.

In order to make the arm 8 resilient in the direction of the movement of the stylus 14, that is, at right angles to the record surface, the lower surface thereof is preferably concaved intermediate its ends as shown at 17 so that the cross section of the intermediate portion of the arm is materially decreased. With this construction the stylus is held firmly in contact with the record groove so that the record is faithfully reproduced. As shown in Figure 2, the stylus arm is preferably wedge

shaped in horizontal section, the broader end of the arm being secured to the member 3, so that the stylus is held rigidly against movements transverse to the record groove. This feature also adde to the correctness and quality of the reproduction.

While I have shown the preferred embediment of my invention, it is evident that many modifications may be made in the structure disclosed without departing from the spirit of my invention.

What I claim as new and desire to project by Letters Patent of the United States is as follows:

townslied Mish. Sucarl A. Alaman - raiding In a device of the class described, the combination with a disphragm and a support therefor, of a stylue arm connected with said disphragm eccentrically thereof, abstantially as described.

- In a device of the class described, the combination with a disphragm and a support therefor, of a stylue arm secured to said support and connected with said disphragm scoentrically thereof, and a stylus mounted in eaid arm opposite the centre of said disphragm, substantially as described.
- 3. In a device of the class described, the combination with a diaphragm and a support therefor, of a flexible stylue arm rightly secured to said support and connected with said diaphragm eccentrically thereof, substantially as described.
- In a device of the clase described, the combination with a diaphragm and support therefor, of a flexible stylus arm rigidly secured to said support and

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connected with said disphragm eccentrically thereof, and a style mounted in said arm opposite the contre of said disphragm, substantially as described.

5. In a device of the class described, the combination with a dispirage and a support therefor, of a stylus arm, and a yielding non-metallic member interpresed between said arm and said dispirage at a position eccentrically of said dispirage, substantially as described.

5. In a device of the class described, the combination with a disphragm and a support therefor, of a flexible stylus arm, rigidly neurred to said support, and a yielding non-metallic number interposed between said arm and said disphragm at a position secontrically of said disphragm, substantially as described.

in a device of the class described, the combination with a disphrage and a support therefor, of a stylus am rigidly secured to said support adjacent the portphery of usid disphrage and connected with said disphrage occupitically thereof, the said arm being of reduced cross section intermediate its ends, substantially as described.

8. In a divice of the class described, the combination with a disphragm and a support therefor, of a non-metallic stylus arm rigidly andired to eald support adjacent the periphery of said diaphragm and connected with said diaphragm solutionally thereof, the said arm being of reduced ores section intermediate its ends, substantially as described.

2 1/26 +1813

b. In a device of the class described, the combination with a diaphragm, and a support therefor, of a stylus arm rigidly secured to said support adjacent the periphery of said diaphragm, the said arm being of reduced cross section intermediate its ende and a yielding non-metallic member interposed between eald arm and eaid disphragm at a position secontrically of said diaphragm, substantially as described.

10." In a device of the class described, the combination with a diaphragm, and a cupport therefor, of a ctylus arm rigidly eccured to eald support adjacent the periphery of eald diaphragm, the said arm being of reduced cross ecction intermediate its ends, a yielding non-metallic member interposed between said arm and eald diaphragm at a position cocentrically of eaid diaphragm, and a stylus mounted in said arm opposite the centre of said diaphragm, substantially as described.

hi. In a device of the class described, the combination with a diaphragm and a support therefor, of a stylue armof gradually increasing width in a direction transverse to the record groove, the said arm being secured at its broad end to said support and connected near its other end with vaid diaphragm, substantially as described.

Insert B- april 15,10 finemer ?

This specification signed and witnessed this 22 md day of march 191'

Thomas A Edison

Witnesseth:

1 Frederick Bachman 2 Anna P. Klehm

Oath.

State of New Tersey ss.,

THOMAS A. EDISON, the above named petitioner, being bully sworn, beposes and says that he is a citizen of the United States, and a resident of Lievellyn Park, West Orange, Essex County, New Jersey,

that he berily believes himself to be the original, first and sole inventor of the improvements in SOUND BOXES

described and claimed in the annexed specification; that he does not know and boes not beliebe that the same was ever known or used before his invention or biscovery thereof; or patented or described in any printer publication in the Chinted States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve mountly prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon sald inbention has been filed by him or his legal representatives or assigns in any foreign country.

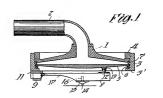
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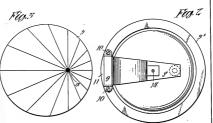
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Inventor:

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Paper No. 2, Dad . All communications respecting this lication about give the acrist number

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON April 25,1911 .

Thomas A. Edison, Care -rank L. Dyor, Orango, New Jorsey .

7001

Please find below a communication from the EXAMINER in charge of your application.
for Sound Boxes, filed March 24,1911, serial number 616,756 .



The blanks left on page 1 should be filled in with the proper perial number and date .

Claim 1 is rejected upon any of the following references: Wart, May 5,1903, #727,257;

Weber, May 25,1905, #790,542,

Hibbard, Oct. 17,1905, #802,212, all in (181-10), also see

Moyer, mept. 25,1900, 658,571, and

Moroross, Tune 11,1901,#676,270, both in (181-10).

No invention can be found in extending the stylus arm of either Edison, -ch. 22,1910, #950,226, or Malson, June 21,1910,#962,081, both in (171-10), or Chisholm, March 10,1908, #881,546, (181-10), so as to attach it cocentrically to the disphrace as in the references cited, leaving the stylus intermediate the ends of the stylus arm, a construction very common in this art as see Mandonald, May 2,1899, #624,055,(171-10) and accordingly claims 2, 3, and 4 are rejected.

Claim 5 is rejected upon the reasons of rejection of claim 1, in view of Edison, reby. 5,1889, #397,280, (101-10), as showing the cork attaching means.

 $\mbox{Claim 6 is rejected upon the reasons of rejection of claims 2 to 4,in view of Edison, last cited.}$

Claims ? and 8 are rejected upon the reasons of rejection

#610,756----2.

of claim 2, in view of Rendall, Aug. 1, 1893, #502,383, (101-8), as showing the stylus arm of 'reduced' cross' section intermediate its ends.

Chains 9 and 10 are rejected upon the reasons of rejection of claim 2, to view of religion, last cited and Rendall . No invention era he found in combining these features in one sound how.

Claim 11 is rejected upon Hart, June 5,1900, #651, 308, or Edison, #962,081, cited, both in (181-10).

IN THE UNITED STATES PATENT OFFICE.

Thomas A. Edison SOUND BOXES

Filed March 24, 1911)

Serial No. 616,756

HONORABLE COMMISSIONER OF PATERTS,

S I R:

Roplying to Office action of April 25, 1911, pleace amend the above entitled case as follows:

In line 20, page 1, after "No." insert

- 616,755; and at the beginning of line 21, same page, insert-March 24, 1911-.

In line 1, page 4, after "diaphragm", insort

- at a point -; and in line 13, eame page, change "may"

to - ie -, and cancel "be".

Cancel claime 1, 2, 3, 4, 5, 7, 8, and 11, and change the numerals of claims 6, 9, and 10 to - 9, 10, and 11 - respectively.

Add the following as claime 1 to 8, inclusive:

1. In a device of the class described, the combination of a sound box body, a single disphragm mounted therein, a etylus, and means for transmitting the movements of the said stylus boasid disphragm, eaid means bearing upon said disphragm substantially at a single point socentricelly of said disphragm, substantially as deeoribed.

- 2 In a device of the class described, the combination of a sound box body, a single diaphragm mounted therein, and a etylue arm connocted cith said diaphragm Canuled 4/10/13

substantially at a single point eccentrically of said diaphragm, substantially as described.

- 5. In a device of the class described, the combination of a sound box body, a single disphragm mounted thorsin, and a flexible stylus arm secured to said body and connected with said disphragm substantially at a single point socentrically of said disphragm, substantially as described.
- 4. In a device of the class described, the combination of a sound bex body, a single disphragm mounted therein, a stylus arm connected with said disphragm substantially at a single point eccentrically of said disphragm, and a stylus mounted in said arm opposite the centre of said disphragm, substantially as described.
- 5. In a device of the chees described, the combination of a sound tox body, a kingle dispirage mounted thorsin, a stylus arm secured to exid body, and yielding means interposed between stid arm and said dispirage and bearing upon said dispirage muletahticily at a single point eccentrically thereof, substantically as described.
- 6. In a device of the class described, the combination of a sound box body, a single diaphragm mounted therein, and a non-metallic ctylus arm connocted with said diaphragm substantially at a single point ecoentrically of said diaphragm, substantially us described.
- 7. In a device of the class described, the ochbination of a sound box body, a single diaphrags mounted therein, a non-metallic stylus arm secured to said body and yielding means interposed between said arm and said diaphrags and bearing upon said diaphrags substantially

at a single point ecoontrically thereof, substantially as departised.

8. In a device of the class described, the combination of a sound box body, a single diaphragm counted therein, a floxible non-metallic stylus arm secured to said body, and yielding means_interposed between said arm and said disphragm and bearing-upon said diaphragm substantially at a single point eccentrically thereof, substantially as described. -

REMARKS

Hone of the references of record shows a sound box having a single disphragm mounted therein and means bearing upon or connected with the diaphragm substantially at a single point occentrically thorsof for transmitting the movements of the stylus to the diaphragm. In the disclosure of Hart there is a total absence of applicant's inventive conception of applying the connections between the etylus lever and the diaphragm to such a point on the diaphragm as to throw the diaphragm out of tune with particular notes. Hart's object was to produce a reproducer having a plurality of diaphragms and a stylus for each diaphragm, and in order to connect each stylus with its diuphragm, he employs a number of connections, some of which he must put slightly off the centre. Obviously, Hart intended to place the connections 21 a and 22 as near the centre of the diaphragm as possible, and these con nections are, in fact, shown very near the contres of the diaphragms. Claims 1 to 8 structurally differentiate from the patent to Hart by specifying a sound box body and a single diaphragm mounted therein. With the combined arrangement of the diaphragms disclosed by Hart, effect the accustic was of a device like that set forth in the claims oculd not be obtained. The maximum effect in reproduction obtained from the various disphragms in Hart's dovice is that of the upper diaphragm which has its stylus connection located at its centre, and is therefore subject to the objections which it was applicant's object to obviate. The quality of the sound waves resulting from the three diaphregme in Hart's reproducer would accordingly be inferior to that of the reproduction from applicant's device. Furthermore, it is printed out that with Hart's plurality of styluses, it would be impossible to obtain perfectly synchronous vibration in all the diaphragms; so that the vibrations of one disphragm would interfere with those of the others, and an imperfect reproduction would result. The patents to Weber and Hibbard do not show the stylus arm applied to the diaphragm substantially at a single point.

In the structure of Moyer, a rigid conical body $\underline{0}$ is employed in place of a stylus lever. This conical body vibrates about the edge thereof adjacent the periphery of the disphrage as a fulcrum and imparts the maximum vibration to the disphrage substantially at the nentral thereof. A large part of the disphrage is held rigid, and the vibration thereof is obviously essentially different from that produced when the connections from the stylus are applied to the disphrage substantially at a single point secentially of said disphrage.

The structure of Morcross is similar to that of Moyer, and fails to anticipate applicant's structure for the same reasons as does Moyer's.

No other references of record discloses a stylus connected to the disphragm eccentrically thereof; and claims 1 to 8 are accordingly thought to be patentable.

Referring to claims 9, 10, and 11, none of the referencee discloses a stylus arm rigidly secured to the diaphragm support, and a yielding non-metallic member interposed between said arm and disphragm. In addition to absorbing the minute scratching vibrations, this yielding member in applicant's device permits a slight variation between the relative angular positions of the portions of the stylus arm and disphragm between which it is interposed without danger of breaking the connection between these parts. This yielding member is, therefore, used in a relation very different from that of the cork piccs a shown in the patent to Edison, No. 397,380, in which patent the stylus arm instead of being consected to the sound box body, is pivotally supported on eaid oork piece. Furthermore, none of the references shows a stylus arm rigidly secured to the disphragm support and decrating upon the disphrage at a position eccentrically of the latter. Claim 11 also distinguishes from the references by specifying that the ctylus is opposite the sentre of the diaphragm while the stylus are is connected with the diaphragm eccentrically thereof.

None of the references discloses applicant's invention nor any equivalent combination, and it is submitted that the assembling and modification of various elements from the references of record to produce applicant's invention, as est forth in the claims in question, could not be accomplished without a knowledge of applicant's disclosure or the exercise of the invention.

Reconsideration and allowance are accordingly

respectfully requested.

THOMAS A. FIDISON
By Brank C. Dyers his Attorney.

Orange, New Jersey

April 3, 1912

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

NITED STATES PATENT OFFICE
WASHINGTON May

May 8,1912.

Thomas A. Edieon, Care prank L. Dyer, Orango, New Jersey . I.S. PATENT OFFICE, MAY 8 1912 MAILED.

Please find below a communication from the EXAMINER in charge of your application.
for Sound Boxee, filed March 24,1911, eerial number 616,756 .

S.B.M.SOFE!

This action is responsive to the amendment filed April 4, 1912.

Claims 1 and 2 are rejected upon Williams, yarch 22,1011, #997,505, (181-11); Tainter, May 4,1886, #341,289, (181-2), see Figure 11 and also as displaying no invention over Hart of resord. Invention is not found in employing only one of Hart's disphragme with the stylus bar connection disclosed.

Claim 3 is rejected upon any of the above cited references.

Invention is not found in making the stylue arm flexible ac

such, de a well known construction as see Murray, July 16,1907,

#860,604, (181-11); Rdison, #962,081 of record; Edison, #950,226

of record; Jones, April 10, 1898, #502, 453, (181-11); Randall of record

or Lumiere Eng. patent, Nov. 16, 1909, #26,613, (181-11).

Claim 4 is rejected upon Tainter, cited, also as displaying no invention over the art disclosed, no invention being found in connecting the stylus arm of Macdonald of record eccentrically with respect to the diaphragm with the stylus opposite the center, in view of Tainter's disclosure or Williams. disclosure.

Claim 5 is rejected upon Tainter; also upon Hart or Williams in view of any construction showing the interposition of yielding means between the stylus arm and the disphragm. Such as shown for example in Jones, May 31, 1898, #304, 829, (103-3); Berlinor, peb-10, 1895, #534, 533, (181-3); Berlinor, July 28, 1896, #534, 586, (181-3); Krasmor, April 21, 1908, #885, 590; Chensy, April 7, 1903, #724, \$35, both in (181-11); Kill, reb. 19, 1901, #366, 183, (181-10), or Edison, #397, 280, of record.

Claim 6 is rejected upon the references cited against alaim 1, in view of any wooden stylus arm as in the two Edison references first cited by the disolocure by W. B. Stout in an article entitled "How to Make a Gramophone" in the Scientific American of April 27,1001.

Claims 7 and 8 are rejected upon the references and reasons of rejection of claim 6 in view of the references cited against claim 5 as showing the yielding means interposed. rejected

Claime 9, 10 and 11 are upon the references cited against claim 1, in view of any of the references showing flexible arms and any of the references showing interposed non metalic members.

IN THE UNITED STATES PATERY OFFICE.

THOMAS A. ROISON,)
SOUND BOXES,)
Filed March 24, 1911, ')
Serial No. 616,756.)

HOMOGRABLE CONCUSSIONER OF PATPERS.

SIR:

In response to the Office action of May 8, 1912, please aren3 the above entitles care anfollows:

In line 12, page 3, after "of" innert

non-metallic material, such as - ; and in line 12, wase page, after "wood" innert a commu (,).

Cancel all of the claims and insert the

following new claims:

- In a serior of the class described, the combination of a disphraga, a ctylus are connected with read disphraga at a position eccentrically of the disphraga, and means conciting with sold arm at a accordance tion to support the same, and are being provided with stylus supporting means intermediate said positions, substantially as described.
- 2. In a device of the class described, the combination of a sound box bedy, a disphrage mounted therein, and a stylue are supported by said sound hox body at a given position and connected with anid disphrage at a second position countrically of the disphrage, and are being provided with stylue supporting means intermediate and positions, substantially as described.

- 3. In a device of the class described, the combination of a sound box bedy, a disphrage mounted therein, and a yielding stylus are rigidly secured to end sound box bedy at a given position and connected with said disphrage at a second position consertically of the disphrage, said arm being provided with stylus supporting means intermediate and positions, substantially as described.
- 4. In a device of the class described, the combination of a disphragm, a non-metallic stylus arm connected with said disphragm at w position occontrically of the disphragm, and means constring with Said arm at a second position to support the same, said orm being provided with stylus supporting means intermediate said positions, substantially as described.
- 5. In a device of the class described, the combination of a disphragm, a stylus are having a yielding connection with eads disphragm at a position occontrically, of the fiaphragm, and means consting with said arm at a second position to support the same, and arm being provided with stylus supporting means internaliate said positions, substantially as described.
- 6. In a device of the class described, the combination of a disphragm, a ctylus arm connected with eaid disphragm at a position occontrically of the disphragm, and means concing with said arm at a second position to support the usne, said arm being provided with stylus supporting means intermediate said positions and substantially opposite the center of said disphragm, substantially an described.

7. In a device of the class described, the combination of a sound how body, a disphragm mounted therein, and a yielding styles arm rigidly secured to entd sound box body at a given position and commenced with estd disphragm at a second position eccentrically of the disphragm, and arm being provided with styles supporting means intermediate seid positions and substantially opposite the center of acid disphragm, unbetantially and described.

REMARKS

Some of the rejected claims are thought not to have been anticipated by the references of record, but an entirely now set of claims is presented herewith in order to more clearly define the patentable features of applicant's invention. All of the claims as now presented differentiate from the references by specifying that the stylus arm is eccontrically connected with the diaphragm and is provided with stylus supporting means intermediate the positions at which it is supported and connected with the diaphragm. With this construction improved results have been obtained by the applicant in the reduction of the prominence of objectionable high uni low notes and in the increase of the loudness of the readvantages of the production. For a statement of the combinations set forth in the claims, the Examiner's attention is directed to page 4 of the specification.

Applicant has produced an improved device not

disclosed or suggested by the references and reconsideration and allowance are accordingly respectfully requested.

Rospectfully submitted,

THOMAS A. EDISON,

34 Frank L. Dyer

Orango, New Jorsey,
April //, 1913.

, Div. 23..... Room 37.9

Address only
"The Commissioner of Petente,
Weshington, D. O."

J. H. D. -Sut.

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All communications respecting this policities should give the serial number, the set allies at linearities.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON

Please find below a communication from the EXAMINER in charge of the application of

..... for Sound Boxes

SBMSOVE/ Considerations of Patricts.

This action is responsive to the amendment filed April 16,

Claims 1 and 2 are rejected on Obelt, English patent, Jan. 29,1897, #2430,(181-10).

Ae it is shown old to connect the stylus are sccentrically to the disphragm in references of record as for example, Tainter, #341,280 or Hibbard, #802,212, or Villiams, no invention is found in so connecting the stylus are in any of the cound boxes cited of record employing the type of arm illustrated in Macdonald, #824,039 of record; also no invention is found in substituting such type of arm as illustrated in Macdonald in any of the first group of references. Accordingly, claims 1 and 2 are additionally rejected for such reasons.

Claim 3 is rejected on the references and reasons above given. The flexible arm rigidly held at one end is shown in Tainter as well as in other references of record as Randall.

Claim 4 is rejected on the references and reasons cited against claim 1. No invention is found in making the arm of wood as such is shown in the references of record as Edison, #968,081.

#616,756----2.

Claim 5 to rejected on the references and reasons of rejection of claim 1. No invention is found in providing the yielding connection with the diaphragm as such is shown common in references of record as Tainter, above cited.

Claim 6 is rejected on Obelt, also on Tainter or Hibbard, it not being seen as patentally material on which eide of the center of the disphragm the arm is attached. The result described by applicant would seem to be the same.

Claim 7 is rejected on the references and reasons last given in view of the considerations fully set out above.

Patent Series

Patent Application Files

Folio # 721 Phonographic Telegraphs

Serial #: 616757

Primary Applicant: Edison, Thomas A

Date Executed: 3/22/1911

Applicant	. Address.			
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		FRANK	L. DYER,	
₹.:		~ 1	Counselly	٧.

Petition.

To the Commissioner of Patents:

Dour Petitioner THOMAS A. EDISON a titizen of the United States, residing and habing a Post Office address at Llewellyn Park, West Orango, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

- PHONOGRAPHIC TELEGRAPHS-

set forth in the annexed specification; and he hereby appoints Frank L. Where (Registration No. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and annedments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A Edism_

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

RE IT KNOWN, that I, THOMAS A. EDISON, a obtizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essox and State of New Jersey, have invented certain new and useful improvements in PHONOSPARHIC TREBURAPHS of which the following is a description:

My invention relates to the transmission of messages to distant points, and has for its object the provision of an improved method and means whereby such messages may be transmitted at a high speed.

My invention is particularly applicable to telegraph and similar systems where, because of the limited speed at which an operator is able to receive the message, the capacity of the line is restricted. In conformity with my object, I provide means whereby a record of the message may be made at a high speed at the receiving station, and then reproduced at any desired slower speed. In the particular embodiment of my invention shown and described herein, I transmit the message telegraphically to the distant station, where the electric pulsations transmitted along the line are transformed into mechanical pulsations, which latter are recorded upon a phonograph record blank. With this construction, it is possible to transmit the characters representing the message along the

line and to record the same on the record blank at as high a speed as 300 words per minute. The resultant record may at any time be reproduced at a speed permitting the operator to easily understand the same.

In order that my invention may be better understood, attention is hereby directed to the accompanying drawing, forming a part of this specification, and showing a diagrammatic view of a telegraph system embedying my invention.

Poforring to the drawing, 1 represents the main line which is supplied with current from a generator or any other suitable source 2 and is grounded at the transmitting and receiving ends, as at 3 and 4 respectively. The numeral 5 represents a transmitter, comprising a metal oylinder 6 rotated by any suitable means (not shown) and a contact brush 7 adapted to engage the periphery of the oylinder. As shown in the drawing, the current of the main line is supplied to the cylinder 6 by a brush 8 engaging the chaft $\underline{9}$ of the oylinder. A non-conducting tape 10 having perforations therein corresponding to the characters representing the message to be eent is fed over the cylinder 6 past the brush 7; so that when the said brush engages the cylinder through the perforatione in the tape, pulsations are thereby eet up in the main line corresponding to the message to be eent. Any other preferred transmitter may be substituted for that shown and described above.

7.37/V The receiving instrument preferably employed bys me comprises a diaphragm 11 secured to any suitable

support 12 and adapted to transform the electrical puleations from the sending etation into corresponding mechanical pulsations or vibrations and to transmit them to a etylus 13 whereby they are recorded upon a rotating record cylinder of wax-like material 14. The etylus 13 is mounted in a lever 14 pivoted to a floating weight 15 which is pivoted to the support 12, so that it is held in engagement with the oylinder 11 with a embetantially uniform pressure regardless of any unevenness or eccentricity in the surface of the cylinder. An electromagnet 16 having a core 17 is placed in the main line circuit at the receiving station and is adapted to vibrate the diaphragm 11 in accordance with the current pulsations in the said circuit. A permanent magnet 18 is secured to the core of the clectromagnet and tends to hold the diaphragm in ite normal position. In order to sharpen the record, I place a condenser 19 in the main line circuit at the receiving end to prevent continuous leakage of currents from streseing the diaphragm of the receiving inetrument.

I have found that the marphoss of the record is materially increased by the provision of an auxiliary ofronti 20 certaining, a magnet 21 and a resistance 22 to regulate the ourrent. This circuit, as shown, is commeted with the main line circuit in advance of the generator 2 and also beyond the transmitter. The resistance 22 as shown preferably comprises two lamps connected in multiple and placed in the auxiliary circuit. These lamps balance the current flowing through the coil 21 by taking upmore or less of the current according to the variations therein. The arrangement described above is such that when the arm 7 is engaged with the cylinder 5, the current

having passed through the transmitter passes part to the main line and part to the auxiliary olrouit; so that when the circuit is broken by the transmitter, the reverse current from the auxiliary circuit neutralizes the statio charge in the main circuit, and the vibrations imparted to the disphragm are sharp and distinct.

In operating the apparatus described above, it is possible to secure a clear and distinct record upon the cylinder 14 even though the apparatus be worked at a very high speed; so that the line has a very high capacity. After the record has been made, it may be reproduced at any desired speed preferably by placing the record cylinder on an auxiliary phonograph (not shown) provided for that purpose.

It is to be understood that my invention is not limited to the specific embediment described above, but that it includes all the modifications falling within the scope of the appended claims.

Having now described my invention, what γ claim as new and desire to "ecure by Letters Patent of the United States is as follows:

1. The method of, transmitting movemers which consists in transmitting coursesponding pulsations or vibrations to the reclaiming station at a high upsed, retransmitting coursesponding pulsations or vibrations to the reclaim station and reclaiming the said pulsations at the receiving station, and
resultant to the same from the recoord by operating the
record at reduced speed, substantially as described.

2. The method of transmitting messages which consists in transmitting corresponding slectrical pulsations

to the receiving station at a high speed, transforming the electrical into-mechanical pulsations at the receiving station, impressing of recording the last named pulsations (upon a suitable blank, and reproducing the cause from the resultant record at a reduced speed, substantially as described.

2) 3. The method of transmitting hospings which consists in providing a strip with perforations corresponding to the characters representing the message to be sent, transmitting electrical pulsations corresponding to the said perforations to the receiving station at a high speed, transforwing the electrical into mechanical pulsations, impremaing on recording the last named pulsations upon—suitable blank and reproducing the same from the resultant record at a reduced speed, substantially as described.

A In a device of the class described, a circuit containing a source of current supply, a transmitter, a phonographic receiver, and means located in proximity to said receiver for preventing leakage of current thereto when the circuit is broken by said transmitter, substantially as described.

5. In a device of the class described, a circuit containing a source of current supply, and a transmitter, a phonographic receiver, and a condenser, the said condenser being located in said circuit intermediate said transmitter and receiver and in proximity to said receiver, substantially as described.

dimented 1/3/2

5. In a device of the class described, a main circuit containing a source of current supply, a transmitter and a phonographic receiver, and an auxiliary circuit provided with inductive recistance connected with said tain circuit and adapted to neutralize the static charte in the main circuit when the latter is broken by the transmitter, substantially as described.

- 7. In device of the class described, a circuit containing a solvee of current supply, a transmitter and a phonographic receiver and a magnet shunted about said source of current supply and said transmitter, substantially as described.
- 6. In a dorage of the class described, a circuit containing a source of current supply, a transmitter, a phonographic receiver, and a condenser, the said condenser being located in said circuit intermediate said transmitter and receiver, and a megnet shunted about said source of current supply and said transmitter, substantially as described.

This specification signed and witnessed this 22 word of March 191/

Thomas & Eain

Malitnesseth:

1. Tracerick Backman 2. Anna P. Klehm

Oath.

State of New Jersey ss.,

THOMAS A. EDISON, the above named petitioner, being buly sworn, deposes and says that he is a citizen of the United States, and a resident of lievellyn park, West Orange, Essex County, New Jersey.

that he verify believes himself to be the original, first and sole inventor of the improvements in PHONOGRAPHIO TELEGRAPHS

described and claimed in the annexed specification; that he does not know and does not believe that the same was either known or used before his induction or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his induction or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve mounts prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A Edism

Shorn to and subscribed before me this 22 May of March 191

[Seal]

Rotary Public.

DIV. XV.IRoom ... 109

Addres only

"The Commissioner of Patents,

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tion should give the scrial number,

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON May F9, 1911.

MAY 29 1911

Thomas A. Edison,

C/o F. L. Dyer,

Orunge. Now Jersey.

Please find below a communication from the $\it EXAMINER$ in charge of your application.

S. No. 616,757, filed Mar. 24, 1911, Phonographic Telographs.

, γ '

DHUSOVE!

This application has been examined.

Chelms 1 and 2 are rejected on patent to Kumberg, 636,209, Oct. 31, 1899, 179 - 6.

Olaims 3, 4 and 5 are rejected on metent to Taylor, 289,173, Nov. 27, 1863, 176 - Automatic, in view of Kumborg. It is considered no invention to use the phonomerable reactiver of Kumborg in the tolographic system of Taylor.

Oleims 6, 7 and 8 are rejected on patents to Trylor and Kumberg, ofted, in view of Mitcon, 147,218, yeb, 10, k874, 178 - Autoratic. In this patent to Misson it is seen to be old to place inductence and resistance in shunt around the transmittor.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison PHONOGRAPHIC TELEGRAPHS

Room No. 109.

Filed March 24, 1911 Serial No. 616,757

HOMORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of Kay 29, 1911, ploace amend the above entitled once as followe:-

Page 3, line 23, after "containing" insert - a source of inductance, such as - .

Claim 1,/line 2, orase "corresponding"; and in line 3, before "to" insert - corresponding to the characters of the messages - .

Claim 2, line 2, erace "corresponding"; and after "pulsations" insert - corresponding to the characters of the messages - .

Cancel Claims 4, 5, 6, 7 and 8.

Add the following claim:-

The method of teamentitum, adjuster, which consists in transmitting locational pulsations corresponding to the characters of the receiving the cherical pulsations at a high speed, transforming the electrical pulsations into mechanical pulsations at the receiving station, recording the last named pulsations are not pulsations as the last named pulsations whener, and another reproducing the same from the resultant record at a regions speed, substantially as described.

REMARKS

None of the references discloses the method of transmitting messages which consists in transmitting pulsations corresponding to the characters of the meseages, to the receiving station at a high speed, recording the pulsations at the receiving station, and reproducing the same from the resultant record at a reduced speed. forme the basis of the subject matter of all the claime as now presented. The Kumberg patent is the only reference Allies in which the idea of transmitting pulsations to a receiving station, recording such pulcations, and reproducing the same from the record is revealed. Kumberg, however, fails to disclose the idea of sending the messagee at a high epeed and reproducing them at a reduced speed, and as a matter of fact, Kumberg'e device would be inoperative if the record were reproduced at a substantially reduced speed, because, as disclosed, it is adapted for telephonic use only, and in order that the sounds shall be distinguishable upon reproduction, the phonograph record must be driven at a speed corresponding to that at which the record was made. berg merely discloses a method of recording the message transmitted and reproducing the same as sent, i. e., reproducing corresponding sounds at the same speed. Applicant's method was devised in order that the capacity of the transmitting line may be increased, while at the same time the messages may be reproduced at the receiving end at such a rate as to be distinguishable by the operator. for which applicant's method is especially adapted, viz., telegraphy, it is not necessary that the pulsations reproduced be of the same duration as those transmitted, but only that the same ratios between the successive pulsations transmitted and the corresponding reproduced pulsations be mainteined. In both the Edison and Taylor references a record is made of the pulsations at the receiving station, but there is no reproduction of such record. The only way in which to decipher these records is by reading, which is slow and tedious.

For the above reasone allowance of the claims is solicited.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyer.
His Attorney

Orange, Hew Jerssy

мау *3* , 1912.

Div.16Room109

Address only
"The Commissioner of Palents,

2-260 F.H.

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DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON June 1'

Thomas A. Edison.

C/o F. L. Dyor,

Orenge, N. J.

JUN 17 1912

Please find below a communication from the EXAMISES in charge of your application.
S. No. 616,767, filed Mar. 24, 1911, Phenographic Telographs.

Commissioner of Potents.

This action is in response to amendment filed May
4, 1912.

Claime 1, 2 and 4 are rejected on the patent to Kumberg, of recerd, and claim 3 to rejected on matent to Taylor, of record, in view of retent to Kumberg. It is of common knowledge that a phonograph may record at one speed and reproduce st snother speed, and in the patent to Jones, 766,189, Aug. 2, 1904, 178 - Automatic, 4, it should be noted that the method is old to record at a very high speed end reproduce at a lower speed. In this repart attention is called to lines 31 to 43, inclusive, page 1 of this patent to Jones.

ulaim 4 is also rejected as an improper method because of the spparetus limitation, namely, phonograph rocord blank.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison PHOMOGRAPHIC TELEGRAPHS Filed March 24, 1911 Serial No. 616,757

Room No. 109.

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of June 17, 1912, please amend the above entitled case as follows:-

Olaim 1, line 3, before "re-" insert - phonographically - . Line 5, before "reproducing" insert - phonographically - , and before "record" insert - resultant - . Lines 5 and 6, cancel "by operating the record". Line 6, before "reduced" insert - greatly - .

Cancel claim 2.

Olaim 5. line 7, cancel "impressing or" and insert phonographically - . Line 8, cancel "upon a suitable blank".

Same line, before "reproducing" insert - phonographically
Line 9, before "reduced" insert - greatly - .

Cloim 4, line 5, before "recording" insert -

phonographically - . Lines 6 and 7, cancel "uyon a suitable phonograph record blank". Line 7, cancel "audibly" and insert - phonographically - . Line 8, before "reduced" insert - greatly - .

Renumber claims 3 and 4 as 2 and 3.

REMARKS

In the decision rendered in Carnogie Steel Co., Ltd. vs. Cambria Iron Company, 99 O. G. 1866; 1902 C. D.. 592, it is stated that in order to anticipate a process it is necessary not only to show that the device disclosed in the patent cited might have been used to carry out the process, but that such use was contemplated. Kumberg of record accordingly dose not anticipate the claims as ho certainly did not contemplate transmitting pulsations corresponding to the characters of the messages to the roceiving station at a high speed and reproducing the same from the resultant record at a greatly reduced speed. Moroover, the apparatus disclosed in this patent could not be successfully used to carry out applicant's process as defined in the claims, as this apparatus is adapted for telephonic use only, and it is necessary, in order that the sounds reproduced from the record made by this apparatus may be distinguishable, to to drive the record at a speed corresponding to that at which the rooord was made.

Taylor of record fails to disclose the step of reproducing the record made at the recording station. Both Taylor and Jones fail to disclose the steps of phonographically recording the pulsations at the receiving station and phonographically reproducing the same from the resultant record at a greatly reduced speed.

For the above reasons, further consideration and allowence of the claims as now presented are requested.

Rospectfully submitted,

THOMAS A. EDISON

By Frank L. Deut

Orange, New Jersey May 23rd. 1913 His Attorney

WH_JS

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Paper No. ...6.......
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DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON 4110

.....August 28; 1913....

Mr. F. L. Dyer,

Oranga, Mew Jarcey.

MAILED

.....Phonographic.Telegraphs.....

ras wing BM Commissioner of Peter

This action is in response to amendment of May 24, 1913.

Claime 1 and 3 are rejected on the patent to Kumborg of reoprd, and claim 2 is rejected on the patent to Kumborg in view of patent to Englor of record.

It is of common knowledge as stated that a phonograph may be operated at any speed desired and the recording at one speed in the patent to Kumberg and reproducing at another speed can not be considered an invention. In telegraphy by the use of a perforated tane if is very common to record at a high speed and reproduce at a lower speed as shown in the patent to Jones cited, showing the principle to be cld.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
PEDECORAPHIC TELEGRAPES,)
Filed March 24, 1911,)
Serial No. 616,757.)

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of August 28, 1915, please smeal the above critical case as follows:

Page 2, lines 28 and 29,cancel "by me".

Olaima 1, 2 and 3, line 1, cancel "transmitting messages" and insort - repid telegraphy - .

Olaim 1, line 2, cancel the matter inserted by the amandment of May 4, 1912 before the word "to" and insert in place thereof - corresponding to the characters of a message or messages - .

Claim 2, line 3, cancel "the message" and

insert .. a moseage or messages -..

Olaim 3, line 3, cancel "the" second cocurrence and insert - a message or - .

REMARKS

Applicant has conceived a new method of repid telegraphy embodying a new combination of steps not disclosed in or suggested by ony of the references of record. So far as applicant is aware. never, previous to his invention, have messages been phonographically recorded at the receiving station of a telegraph system. Xumberg absolutely fails to disclose applicant's invention, the apparatus disclosed in his patent comprising a telephone system combined with phonographic apparatus to record speech at other and of the line and to transmit such of recorded

speech from one ont of the line to the other - - it being essential in Kumberg's apparetue, in order to secure estimated to the product of the phonographic record be reproduced at the same speed at which it was recorded. As has been set forth in the remarks accompanying previous smeakents, the reproduction of the phonograph record or records employed in Kumberge device at a substantially different appeal from the speed of recording thereof would render Kumberg's device inoperative for the purposes for which it was intended and designed.

Referring to the rejection of claim 2 on Kumberg in view of Taylor, it is submitted that it is not at all obvious how the devices disclosed in these patents could be combined so as to produce upperatus capable of currying out the method described in this claim, but that such a combination would involve invention.

The patent to Jones appears to be the only reference of record disclosing a method of rapid telegraphy in which the messages are transmitted and recorded at a high speed and them enablely reproduced at a lower speed. Jones, however, found it necessary to employ a very complicated and expensive appearatus to carry out this method and did not contemplate the recording of the messages phonographically and the phonographic reproduction of the resultant record. Applicant, by his improved method is enabled by a computatively simple and inexpensive appearatus to obtain a record of very rapidly transmitted messages which do not need to be deciphered but which may be audibly reproduced in such a manner as to be rendered intelligible to a listomer.

For the above reasons, further consideration and allowance of the claims are requested.

Respectfully submitted,

THOMAS A. EDISON.

By Firank L. Deper

Ormge, New Jersey July 27, 1914. his Attorney.

WAH-KOK

Olv....16... Room 109. WPH

Address only
"The Commissioner of Patents,
Washington, D. C.,"

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DEPARTMENT OF THE INTERIOR

NITED STATES	PATENT	OFFICE
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WASHINGTONSent. 21, 1914.....

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· Please find below a communication from the EXAMINER in oh	arge of the application of
Thomas 1. Edison, Sr. No. 616, 757, T1124	
H.	Commissioner of Patents.
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-sei	

Nating 55%,126, march 2, 1897, (178-3) it is old as shown to transmit rapidly, record at this high speed and then reproduce at a slower speed. Therefore the broad method claimed by applicant is not novel. The specific method of transmitting intelligence by repid impulses, rapidly recording them on a phonograph and reproducing them more slowly is but a change in the specific type of recorder rather than a change of the method

the specific type of rosorder rather than a change of the metho itself. It is as applicant is well aware, extremely common to run a phonograph rapidly or slowly, just as desired. The phonograph, then, is well understood, as a receiver of a type which can be used in the method practiced by Jones or Weiny, and its substitution is believed to be obvious.

Attention is called to the patent to Gibboney, 465,188, Nov. 17, 1891, (179-6), as a further example of the type of phonograph receiver capable an described in the patent of recording at one speed and reproducing at a different speed. (In this case faster). It is believed plain Gibboney's phonograph receiver could without invention be substituted for that of Jones or Wainy. Looked at in another way the recorder of Gibboney could be without invention made to record the impulses.

in the sec thirty-specified negly readout deplumpage a new

616,757----2.

from the Taylor transmitter.

For the above reasons the claims are again rejected.

Exeminer, Div. 16.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison PHONOGRAPHIC TELEGRAPHS Filed March 24, 1911

Room No. 109.

Serial No. 616,757

HONORABLE COMMISSIONER OF PARENTS,

SIR:

This letter is responsive to the Office action of Soptember 21. 1914.

It is thought that claims 1, 2 and 3 should be allowed in their present form. It is submitted that applicant has devised a new method of rapid telegraphy involving the steps of phonographically recording messages transmitted to a receiving station at a high speed and then phonographically reproducing the same at a greatly reduced speed. None of the references cited discloses the specific mothod consisting of the combination of steps described in the claims. It is thought that the use of the phonograph receiver of Gibboney No. 463,188 in place of the receiver or recorder in the systems of Taylor, Jones or Weiny, in making a phonographic record of messages transmitted at a high speed and the reproduction of such mossages from the resultant record at a greatly reduced speed is not an obvious thing to do, but involves a change in the method of Taylor, Jones and Weiny necessitating the exercise of invention. The advantages resulting from the new combinations of steps described in the claims are clearly set forth in the specification and in the remarks accompanying previous amendments

The steps of phonographically recording the messages transmitted to a receiving station at a high speed and phonographically reproducing such messages from the resultant record at a greatly reduced speed, which steps are included in each of the claims new presented, introduces into the broad method disclosed by Taylor, Jones and Veiny a different idea of means. Consequently, the method claimed herein is a new method and a new invention. In this connection the Examinor's attention is directed to page 255, Vol. 1 of Robinson on patents, where it is stated in effect that any variation in the number or character of the steps of a method which introduces a different idea of means constitutes a new art and a new invention.

A usoful result is attained by applicant's process, and as the art cited does not disclose the said process, reconsideration and allowance are respectfully requested.

Rospectfully submitted,

THOMAS A. EDISON
By Frank L. Lover

Orange, N. J. September 9, 1915 His Attorney

WH-J8

F. U.

Paper No. 10 72/ All communications respecting this distation should give the serial number, date of illing, tille of invention, and

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON Oct.

Oct. 12, 1935.

Ar. F. 1. Dyor. Orence, Now Jorsey. 301 - 121 - 2

Please find below a communication from the EXAMINER in charge of the application of
T. A. 1315001, S. 110, 614,757, 11104 Nov. 24, 1911.

Phonographic Tolographs.

Thomas Ewing

c 6—2631

This action is in resonned to dominication "iled Cent. 10, 1915.

The retents to Secare, 277,749, by A, JAPS, and 283,665, Auv. 23, JAPS, 179 - 13, and plac that to Poulean, 273,083, Sec. 10, JOP7, (correctally lines 13-15, news 11, JAB - 1, and wade of record.

These petents show it is old to transmit a beloproside code members, and thereby repreduce the meamum. The only point in applianct's almine, over this state of the art, lies in the <u>randa</u> transmismine is ecordiar, and the <u>alegor</u> reproduction, the purpose of which is to save time in the use of the transmission line. These Jones, Taylor and Weine disclose, what applianct is well aware of, that it has lost been customery to utilize a transmission line to an increased degree by <u>randaly</u> transmitting and recordiar the meanupos and then, (an stated in lines 31 to 36, page 1, of the Jones putent), at the recolution and of the line reproducting the recorded 616,757 -- 2.

consers more slowly by reprint the strip "through a local direct to coretize an ordinary large grander at a reduced speed", it resem to the examinar the claims do not define more than an obvious use of either of the separar or the "ouline system. Anch a use is believed to be clarrly surrented by Jones, Taylor and Toins, and the oldering replacion.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison PHONOGRAPHIC TELEGRAPHS

Room No. 109.

Filed March 24, 1911 Serial No. 616,757

Serial No. 616,707

HONORABLE COMMISSIONER OF PATENTS,

SIR:

This lotter is responsive to the Office action of October 12, 1915.

The rejection of the claims on the references cited in the last Office action is believed to be unwarranted. These references fail to disclose the principal steps of applicant's method which are set forth in each of the oldims, namely, the steps of phonographically recording at a high speed messages transmitted to a station and then phonographically reproducing such messages from a resultant record at a greatly reduced speed. Moreover, it is submitted that in view of the patents to Jones, Taylor and Weing, none of which discloses the idea of phonographically recording messages and then phonographically reproducing such messages, and each of which involves the employment of moans altogether different in character from the means smployed by Rogors and Poulsen, it would not be an obvious thing to employ the systems of Rogers and Pulsen to carry cut applicant's method. Phonographs are usually operated at the same speed, both in recording and in reproducing,

and no reference has been cited disclosing a method wherein a phonographic record is made at one oped and roproduced at a greatly reduced eped for purposes similar to those set forth in this application, or indeed for any other purpose. In the further consideration of the claims, the Examinor is requested to carefully reconsider the arguments act forth in applicant's letter of September 10, 1016.

Further consideration and allowance are respectfully requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dyen.

Orange, H. J.

WH-JS

Div. 16 Room 109

Attractory only
"The Commissions D. C.,"
Washington, D. C.,"

2-260 F. H. Paper No. 12 7 2
All communications respecting this
application should give the serial number,
date of filing, title of layenties, and

DEPARTMENT OF THE INTERIOR

HMITED	STATES	PATENT	OFFICE

WASHINGTON

Juno 12, 1916.

Orange, R. J.

JUN 12 LUIS

Please find below a communication from the EXAMINER in charge of the application of T. A. Edison, S. No. 616,757, filed Jnr. 24, 1911.

Phonographic Telagraphs.

Thouse Every

This action is in response to argument filed May 31, 1916.

The claims are even rejected upon the references and for the reasons of record.

The exeminer has fully reviewed the art and iter relation to the claims and also ampliant's arguments. It is thought there is nothing retentable disclosed in the application. Strictly, applicant does not phonographically record the measure, as those is nothing phonographic about the transmission and recording of electric impulses produced by a make and brook device and recorded by a memont. The record made is not a sound recorded by a memont. The record made is not a sound record at all, altho, when ussociated with different mechanisms, it may be used to produce sound.

The case has been panding over five years and has been many times considered. This rejection is, therefore, made final.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Bdison PHONOGRAPHIC TELEGRALES Filed March 24, 1911 Serial No. 616,757

HONOTABLE COMMISSIONER OF PATENTS,

SIR:

I hereby constitute and appoint DYER

& HOLDEN (Registration No. 7244), a firm composed of Frank L Dyer and Delos Holasn, where address is Edison Office Building, Orange, New Jersey, as my vesocistes in the prosecution of the above entitled application, and request that all correspondence be addressed to them until further notice.

Frank L. Dyer.

Orange, N. J. January /J , 1917.

Patent Series

Patent Application Files

Folio # 722 Talking Machines (Case A)

Serial #: 617674

Primary Applicant: Edison, Thomas A

Date Executed: 3/28/1911

Applican		Address.		
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le Talking M	achines (Case	<u>a)</u>		
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`	30.		1 .	
Commence of the			L. DYER,	
		100	Counsel, Orange, New Jers	

Tron a.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON, a citizen of the Chuird States, residing and bating a Post Office address at Llewellyn Park, west orange, Bosex County, New Jersey,

prays that letters patent may be granted to him for the improvements in

-TALKING MACHINES-

set forth in the annexed specification; and he hereby appoints Frank A. Wyer (Registration Lo. 560), of Grange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A. Edison

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

HE IT KNOWN, that I, THOMAS A. EDISON, a oitizen of the United States and a resident of Llewellyn park, West Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in TAIXING MACHINES, of which the following is a description:

My invention relates to talking machines and more particularly to an improved method and means for recording composite sound productions such as are produced, for example, by a singer and accompanist.

It has heretofore been the practice to record only the resultant sound produced by the combination of the sounds from the various sources of the composite production. This method is objectionable in that the superposition of the undulations corresponding to the sounds from each source produces a very irregular record impression which it is difficult to accurately trace with a reproducing stylus; so that when such a record is reproduced, the distinctness of the individual parts of the composite sound production is necessarily more or less destroyed so as to render it impossible to give desired prominence and distinctness to any particular part, for example, that of the singer.

My invention has for its principal object, the provision of a method and means for overcoming this ob-

jection. In conformity with this object, I record the part or parts to which I desire to give most prominence separately from the rest of the production and in such a way that the various parts may be simultaneously reproduced in perfect synchronism. In carrying out this method, the record may be made upon a single blank as in the preferred embodiment of my invention disclosed in this application or upon separate synchronously rotated blanks as in the emoddiment of my invention disclosed in my companion application entitled Talking Machines, and filed on even date herewith, or in any other suitable way. In addition to my improved method of recording sound, my invention comprises simple and efficient means for carrying the same into affect and also a new form of record resulting therefrom. Other objects of my invention will appear more fully in the following specification and appended claims:

In order that my invention may be more fully understood, attention is hereby directed to the accompanying drawings forming a part of this opecification and in which. -

Figure 1 represents a plan view partly in section of a preferred type of recording means used in carrying out my invention;

Figure 2 represents a front elevation of the device shown in Figure 1, part of said device being shown in section taken on line 2-2 of Figure 1; and

Figure 3 represents a plan view of a preferred type of reproducing means. In all of the views, like parts are designated by the same reference numerals.

Referring to Pigures 1 and 2, the numerals 1 and 2 represent two adjacent rooms or compartments

separated by a wall 3 having mounted therein a window 1 permitting vicion from one compartment to the other. The numeral 5 and 5 represent the side walls and the numeral 7 the top wall of the compartmente. Supported in any suitable way in the compartment 2 as by a bracket 3 is a sound recording machine 9 of any suitable type. The bracket 8, as shown, is provided with a flagge 10 secured by viveta or other fastering means 11 to the wall 3. The machine 9 is provided with a vertical shaft 12 rotated by a motor in a cubinet 13. This shaft has becaused thereto at its upper end, a table 14 for supporting a sound record or blank 15.

For recording upon the blank 15 the counds from the various compartments, a plurality of recorders $\underline{16}$ are provided, each of these recorders being mounted in a traveling carriage 17 which is pivotally and slidably mounted at one end upon a horizontal rod 18 eupported in brackets 19 on the base of the machine 9. The opposite end of each carriage 17 is slidably supported upon a straight edge 20 projecting vertically upwards from the base of the machine 9. Each carriage 17 has secured thereto a spring arm 21 supporting at its free end, a feed nut 22 adapted to meen with a rotatable feed screw 23which is supported by pivoto 24 in the brackete 19. In the embodiment of the invention shown, the threads on opposite sides of the centre of the feed sorew $\underline{23}$ are turned in opposite directions so that the carriages $\underline{17}$ and reproducers 16 are fed in opposite direction on the record blank 15. For driving the feed screw 23 from the shaft 12, I provide a horizontal shaft 25 having secured

at its opposite ends a bavel gear 26 and a spiral gear 27 adapted to respectively engage the bavel gear 28 on a shaft 12 and the spiral gear 29 on the feed corew 25. The shaft 20 is mounted in bearings 29 on the base of the machine 9.

Each reproducer has connected thereto a sound conveyor 30, one of which is located entirely in the compartment containing the machine $\underline{9}$ while the other extende through the partition wall 3 into the compartment In order to produce a close connection between the last named sound conveyor and the partition wall, the latter is provided with a number of metallic flanges 31 having curved ende 32 forming a substantially spherical socket. The sound conveyor extending through the eaid wall has secured on its outer surface by friction or otherwise, an annulus 33 having a spherical outer surface adapted to fit closely in the socket formed by the members 31. With the construction described above, the sound conveyor extending through the wall 3 has a free universal movement and at the same time a close connection is obtained between the eaid conveyor and said wall, so that the various compartmente remain substantially sound tight.

In using the apparatus described above, in carrying out my invention, the einger or other source to which is desired to give most prominence is placed facing the exit of one of the sound conveyors, and the orchestra or other sources of sound is placed in front of the exit of the other sound conveyor. The record blank 15 having been placed upon the table or support 14 and the motor in the easing 13 having been set in operation, a director

gives a signal through the window 4 for bringing the two sources of eound into time with each other. The rooms or compartments 1 and 2 being practically sound tight, the sounds from the various sources are independently recorded upon the blank 15. In the arrangement shown in Figure 1 the recordere 16 are so placed that the spiral record impressions made thereby are located on the record blank with their convolutions alternating with each other, but evidently many other arrangements may be used. When it ie desired to reproduce the original production, the record made by the method indicated above is placed upon the turn table 34 (see Fig. 3) of a sound reproducing machine 35 of any preferred type. The reproducers 36 having been placed at the starting points of the various record impressions as indicated in Figure 3, the record when set into rotation produces in the reproducers 36 sound vibratione which are given forth through to the pivoted sound conveying arms 37 and the fixed amplifying horns 38 in perfect synchronism. As the regularity of the undulations corresponding to the sound from the principal source, for inetance, that of the singer, is not destroyed by the superposition of the undulations corresponding to the sound from the other source or sources, the first named sound can be reproduced with a high dagree of dietinctness. In addition to this advantage, the wes of separate record grooves and reproducers greatly increaces the volume of the sound given forth.

Whils I have described the preferred embodiment of my invention, many changes may be made in the specific structure described and shown without departing from the spirit of my invention and I do not, therefore, wish to be limited to this disclosure.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

. A record for compesite sound productions having a plurality of record impressions sach representing a part of the composite production, the said impressions being arranged a simultaneously set into vibration synchronous sound waves for producing the composite production, substantially as set forth.

 A report for composite sound productions having a plurelity of concentric spiral record impressions each representing a part of the composite production, the said impressions being arranged to simultaneously set into vibration synchronous sound weres for producing the composite production, substantially as set forth.

The method of recording composite sound productions which consists in producing independent mechanical vibrations corresponding to the sound from each of several sources and synchropoguity impressed these vibrations, in a suitable record material, substantially as set forth.

the method of recording composite sound productions which consists in producing independent mechanical vibrations corresponding to the sound from each of several sources in a plurality of spaced recording explanes, and feeding suitable interactive record material symbnomously past the said styluses, so as to impress these vibrations in separate paths in the record material, substantially as set forth.

3 Commenced 4/24.18

The method of vocording composite sound productions which consists in producing independent mechanical vibrations corresponding to the sound from each of several sources and synchronously impressing these vibrations in a rotating record blank, substantially as set forth.

f. The method of recording composite sound productions which consists in producting independent mechanical vibrations corresponding to the sound from each of several sources and synchronously impressing these vibrations in concentric spiral paths having alternately arranged convolutions in a-rotating-record

the record support, substantially as set forth.

Y. In a device of the class described, the combination of a rotatable record support, and a plurality of sound boxes provided with independent sound conveyors and adapted to be moved synchronously over the face of the record support, substantially as set forth.

8. In a device of the class described, the combination of rotatable record support, and a plurality of recorders provided with independent sound conveyors, and means for producing a synchronous feeding movement between said recorders and said support, substantially as set forth.

 In a device of the class described, the combination of a plurality of sound tight compartments, a rotatable record support in one of said compartments, sound conveyors each having an enlarged open portion located in one of the compartments and a recorder connected with each sound conveyor, all of said recorders being adapted to move synchronously over the face of the record support, oubstantially as set forth.

- 10. In a device of the class described, the combination of a plurality of sound tight compartments, a rotatable record support in one of said compartmente, sound chreyors, each having an enlarged open portion located in one of the compartments and a recorder connected with each sound conveyer, and means for feeding eaid recorders synchronously across the record support, substantially has set forth.
- in a device of the clase described, the combination of a plurality of sound compartments having a partition wall therebetween, a rotatable record support in one of eaid compartments, a sound conveyor extending through eaid partition wall, means permitting lateral movement of said conveyor for producing a closed connection between said well and conveyor, and a recorder connected with said sound conveyor and movable transversely and vertically of the face of said record support, substantially as set forth.
- 12. In a device of the class described, the combination of a plurality of sound compartments having a partition wall therebetween, a rotatable record support in one of said compartments, a sound conveyor extending through said partition wall, means permitting universal

movement of said conveyor for producing a closed connection between said wall and conveyor, and a recorder connected with said sound conveyor and movable transversely and vertically of the face of said record support, substantially is set forth.

13. In a device of the class described, the combination of a plurality or sound compartments having a partition wall thereference, a rotatable record support in one of said compartments, a sound conveyor extending through said partition wall, means permitting lateral movement of said conveyor for preducing a closed convection between said hall and conveyor, a recorder connected with said sound conveyor, a separate sound conveyor located entirely in the compartment containing said record support, a recorder connected with said last named sound conveyor, and means for feeding said recorders simultaneously across the record support, substantially as set forth.

14. In a device of the class described, the combination of a plurality of sound compartments having a partition wall therebetween, a rotatable record support in one of said compartments, a sound conveyor extending through said partition wall, means permitting universal movement of said conveyor for producing a closed connection between said wall and conveyor, a recorder connected with said sound conveyor, a separate sound conveyor located entirely in the compartment containing said record support, a recorder connected with said last named sound conveyor, and means for feeting said recorders simultaneously across the record support, substantially as set forth.

This specification signed and witnessed this 28th day of March 191

Thomas X Edison

Mitnessetli:

Treamich Backman

2. Anna P. Klehm

Oath.

State of New Jersey \ ss., County of Essex

THOMAS A. EDISON, the above named petitioner, being buly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex County, New Jersey,

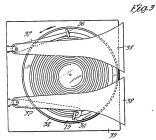
that he verily believes himself to be the original, first and sole inventor of the improbements in TALKING MACHINES

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 2 rd day of March 191/ Anna P. Klehm

[Seal]

617674 F, Eg. Z



Mil MC39C5: Travel D. Welling Frederick Backmann

Shower A. Edwin Shower A. Edwin Ey Erana E. Min. Will Ally.

Div. ...23... Room ...379...

2-200 FED

Paper No.2......
All communications respecting this plication about give the serial number

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON May 3, 1911.

Thomas A. Edison,

C/o Frank L. Dyer.

Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application. Ser. Mc. 617,674, filed Har. 29, 1911, for Inking Prairies.



The proper serial number should be given on page 2. 9 in not on the drawing. Where is 29 shown in Fig. 1?

Clakes 1 and 2 are dramm to a record. Claims 3, 4, 5 and 6 are drawn to a process. Claims 7 to 14 inclusive are drawn to a talking machine. Division between these several groups is required according to the provisions of Nule 42.

In amending this case applicant should consult the following references:

Linedonald Oct. 21, 1902, 711,706, (181-2)
Hill Oct. 2, 1900, 689,020, (181-2)
Wooster, Nov. 9, 1909, 939,781, [181-3]
Hobson, Eng. Pat. June 15, 1907, 13,888 (181-3)

... Examiner, Div. 23.

IN THE UNITED STATES PATERT OFFICE.

THOMAS A. EFISOH,)
TALKHING MACHINES,)
Sorial No. 617,674)
Filed March 29,1911)

HOHORABLE COMMISSIONER OF PATRICE,

SIR:

シ

In response to Office action of May 3, 1911, please amend the above entitled case as follows:

In line 10, page 2, after "application" insort - Scrial No. 617,675 - .

In line 4, claim 3, change "impressing"

to - recording - and after "vibrations" insort - independently of each other - . ;

In line 5, claim 4, cancel "indentable".

In line 4, claim 5, change "impressing"
to - recording - ; and in line 5, same claim, after
"brotions" insert - impendently of cuch other - .

In line'5, claim 6, after "vibrations" insert - upon a rotating record blank -; and in lines 6 and 7, same claim, camed "in a rotating record blank ". Cancel claims 1, 2 and 7 to 14 inclusive and change the numerals of claims 3, 4, 5 and 6 to 1, 2, 5 and 2 respectively.

Add the following claims:

A. The mothed of recording cound vibrations immitted even a plurality of sources which consists in convergence the contract of the contract of

and symphonously recording the different sets of sound wibrations in separate paths in the record material, substantially as described.

simultaneously entited from a function of courses which constitute in accounting the sound vibrations from soon of the courses. Independently of those from the other sources to separate recording means and in then simultaneously and synchronously recording the different cots of sound vibrations in separate patterns and synchronously recording the different cots of sound vibrations in separate patterns on a single record blank, substantially as described.

The mothed of recording composite sound productions, which consists in emusing the estation in separate sound-proof compartments of sound vibrations from each of a plurelity of sound sources, in conveying the sound vibrations from each of the compartments independently of these from the other compartments to separate recording means, and in them estandiancountly and synchronously recording the different sets of sound vibrations in separate paths in the record material, substantially as

The method of recording composite sound productions, which consists in causing the emission in separate sound-proof compartments of sound vibrations from each of a plurality of sound sources, in conveying the sound vibrations from each of the compartments independently of those from the other compartments to separate recording means, and in them simultaneously and synchronously recording the different sets of sound vibrations in separate paths upon a single record blank, substantially as described.

The method of recording sound vibrations simultaneously omitted from a plurality of sources which consists in conveying the count. Therefore from the other sources to sources interpretable country to those from the other sources to separate recording means and in then simultaneously and synchronously recording the different sets of sound vibrations upon a retatable record blank in separate epiral paths having alternately arronged convolutions, substantially as described.

REMARKS

The reference numeral 9 is shown in Fig. 2; but the Examiner is respectfully requested to apply the same to the base plate of the recording machine in Fig. 1. The spiral gear 29 is shown in the middle of the feed serow 23 in Fig. 1; and the Examiner is respectfully requested to apply the reference numeral thereto in the said figure.

The claims as now presented are all drawn to a plicant's process; and action on the morite thereof is accordingly respectfully requested. The right is reserved to file divisional applications on the subjects matter of the curecide claims.

Rospectfully submitted,

Orengo, Now Jersoy, April 8, 1912. THOMAS A. ELISON

By Stank L Due.

his attorney.

Div. 23. Room 379

2-200

Paper No. ReJ.

communications respecting this ation should give the seriel number,

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

May 13,1912.

Thomas A. Edison, Care Frank L. Dysr, Orange, Now Jersey . U.S. PATRIT OFFICE,

MAY 181912

MIAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Talking Machineo, filed March 29,1911, ecrial number

S.B.M.S.T.C. Consequence of Patents.

This action is responsive to the smendment filed April 9, 1912.

Claime 1, 2, 3, 5 and 6 are rejected upon Hill of record; Hacdonald of record; Hobeon of record; Jungren, June 20, 1911, #995,680, (181-3).

Claims 4 and 9 are rojected upon the cited art. So far as applicant's process is concerned it is putertably immaturial in what conformation the record grooves are produced. Such an arrangement of roject grooves, however, are old in Klein, March 6,1906, #814,055, (101-17).

Claim 6, line 2, correct the syslling of "plurality". Claims 7 and 8 ars rejected upon the cited art. The degree

to which the several psrformers are isolated, is not patentably material so far as applicant's process is concorned.

Claims 7 and 8 are also objectionable as defining the process by the apparatus employed.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
TALKING MACHINES,)
Filed March 29, 1911,)
Sorial No. 617,674.)

HONORABLE CONTINUES OF PATRICES.

SIR:

In response to the Office action of Eny 13; 1912, plasse amend the above entitled case as follows:

Cancel claims 1, 2 and 3.

In lines 3 and 4, claim 5, change "conveying the sound vibrations from each of the sources independently of those from the other sources" to _ isolating the vibrations from one source from the vibrations from another source, conveying each isolated set of vibrations -; and in line 5, some claim, after "mouns" insert a comma (,).

In line 2, claim 6, change "plutelity" to - plurelity -; in lines 3 and 4, same claim, change "conveying the cound vibrations from each of the sources independently of those from the other sources" to - isolating the vibrations from one source from the vibrations from another source, conveying each isolated set of vibrations -; and in line 5, same claim, after "means" insert a comms (.).

In lines 3 and 4, claim 9, change "convoying the sound vibrations from such of the nources Andependently of these from the other sources" to - isolating the vibrations from one source from the vibrations from machine source, convoying each isolated set of vibrations -; and in line 5, same claim, after "means" insert a comma (,).

Change the numerals of claims 4 to 9 inclusive to 1 to 6 inclusive.

REMARKS

Reforring to the rejection of claims 1 and 6 (former claims 4 and 9) it is pointed out that the production of different arrangements of the record undulations
or vibrations involves different precedures in currying
out the recording process, and the formation of the record
growed in a certain shape and arrangement is accordingly
thought to be properly a part of the process. The more
fact that a process may be quasi-mechanism in its nature
does not remier it unputentable. The patent to Klein does
not show an arrangement of record growes as specified in
the claims in question, once Klein's grooves P being a
guide groeve and not a record groeve (see lines 39 to 42
of Klein's specification).

Claims 2, 3 and 6 differentiate from the references of record by cpocifying the otep of isolating the vibrations from one source from the vibrations from menther source. In all of the references, some of the vibrations intended for each recording instrument are permitted to commingle with and become recorded with the vibrations intended for other recording instruments. As the isolation of the vibrations as specified in these claims is the most important object of applicant's invention, the importance thereof in applicant's process is obvious.

Claims 4 and 5 differentiate from the references by specifying the stop of causing the emission in coparate sound proof compariments of sound vibrations from each of a plurality of sources. The remarks made above in comnection with claims 2, 3 and 6 apply equally well to claims 4 and 5. Referring to the Examiner's objection to the last named claims, it to thought that there is no objectionable reference to apparatus in those claims. The expression "causing the emission in separate sound proof compartments, etc." states, it is submitted, a true process step, the sound proof compartment being specified to facilitate an accurate description of this step.

The claims are thought to be patentable, and reconsideration and allowance are respectfully recuested.

Respectfully submitted,

THOMAS A. EDISON,

By Mun L. Dyle,

Mis Attorney.

Orange, Now Jersey, April 24, 1913.

FB-KGK

DIV23..... Room37.9....

**The Commissioner of Patents.

2-260

J.H.D.- Sut.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTONFune 3;1913.

Frank L. Dyer,

..... Orange, New Jares; .

U.S. PATENT OFFICE, JUN 8 1913 MAILED.

... for Talking Machinee ...

c 6--903

SBMsore!

This action is responeive to the amendment filed April 25,

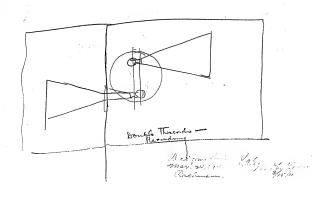
Claim 1 is rejooted on Tore, French patent, Feb. 18,1910,
412,888, (181-3). No invention is found in arranging his grooves
as in Berliner, October 12,1909, 936,976, (181-17). See also
Counde, French patent, mec. 11,1907, 384,921, (181-3).

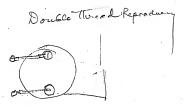
Claim 1 is also rejected on the references of record for the reasons of record. The arrangement of the epiral is patentably immaterial ,especially as respects the process, ha process of the references being the same as applicant's.

Claims 2, 3, 4 and 5 are rejected on Tors; also on the references of record for the reasons of record. See especially the disclosure in Jungram, The degree of isolation of the different recording instruments is patentably immaterial, especially as regards the process, that of the references so far as the

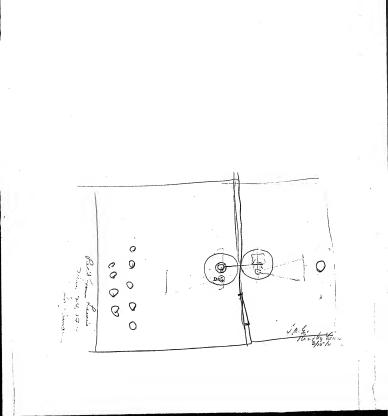
Claim 6 is rejected on Tore; also on the references and reasons of record, in connection with the reasons set out in the rejection of claim 1..

procees is concerned, being the same as applicant's .





Read from Leaving La le they ferris



Patent Series Patent Application Files

Folio # 723 Talking Machines (Case B)

Serial #: 617675

Primary Applicant: Edison, Thomas A

Date Executed: 3/28/1911

Applicant. Thomas A Edison		iress.
itie Talking machines (&	Case B)	
iled March. 29.1911.	Examiner's Ro	oom No
ssignee		
ss'g't Exec. Recorded_	Liber	Page
Patent No.	Issued	
AC	TIONS.	
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Come E.

Petition.

To the Commissioner of Patents:

Pour Petitioner TIO'IAS A. TDISO'I, a citizen of the United States, residing and having a Post Office address at Linucllyn Park, West Orange, Book County, New Jersey,

prays that letters patent may be granted to him for the improvements in

-TALKING MACHINES-

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration Lo. 560), of Stange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas & Edison

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in TALKING MACHINES, of which the following is a description:

My invention relates to talking machines and more particularly to an improved method and means for recording composite sound productions such as are produced, for example, by a singer and accompanist.

It has heretofore been the practise to record only the resultant sound produced by the combination of the sounds from the various sources of the composite production. This method is objectionable in that the superposition of the undulations corresponding to the sounds from each source produces a very irregular record impression which it is difficult to accurately trace with a reproducing stylus; so that when a record thus formed is reproduced, the distinctness of the individual parts of the composite sound production is necessarily more or less destroyed so as to render it impossible to give desired prominence and distinctness to any particular part, for example, that of a singer or other soloist.

Renal 20 517. 674

In my companion application for Letters Patent entitled "Talking Machines" filed on even date herewith. I have described a method and means for evercoming this objection. My present invention is a modification of that described in said companion application. In the method disclosed in this application, I record the parts of the composite sound on separate record blanks preferably by mounting these blanks on separate machines placed in separate compartments, the said machines being driven in synchronism by any suitable means. I can then reproduce the composite production by reproducing the resultant records on separate machines driven in synohronism. In addition to my improved method, my invention comprises simple and efficient means for carrying the same into effect. Other objects of my invention will appear more fully in the following specification and appended claims.

In order that my invention may be more fully understood, attention is hereby directed to the accompanying drawings forming part of this specification and in which -

Figure 1 represents a plan view partly in section of the preferred embodiment of my recording means;

Figure 2 represents a front elevation of the device shown in Figure 1, part of said device being shown in section taken on line 2-2 of Figure 1; and

Figure 3 represents a plan view of my preferred reproducing means.

In all of the views, like parts are designated by the same reference numerals.

Referring to Figures 1 and 2, the numerals 1 and 2 represent two adjacent rooms or compartments separated by a wall 3 having mounted therein a window 4 permitting vision from one compartment to the other. The numerals 5 and 6 represent the side walls and the numeral 7 the top wall of the compartments. In each compartment is placed a talking machine 2. These machines, in the form of my invention disclosed, are provided with downwardly turned flanges 9 secured by a rivet or other securing means 10 to the partition wall 3 of the compartment. Each machine is provided with a taols or support 11 for a record or blank 12 and is secured to and rotatable with a shaft 13. The shaft 13 of one of the machines, for example, that in the compartment 2 as shown, is connected with and rotated by a motor mounted in a casing 14 aspending from the base of the corresponding machine. Mounted in a bearing 3' in the wall 3 is a horizontal shaft 15 having secured at its opposite ends bevel gears 16 and 17. The gear 16 meshes with the bevel gear 18 secured to the shaft $\underline{13}$ of the machine in compartment $\underline{1}$, and the gear 17 with the bevel gear 19 secured to the shaft 13 in the compartment 2. By means of the above described connecting gearing, the record supports or tables 11 are rotated in synchronism by the motor in the casing 14.

Each machine is provided with a recorder 20 mounted in a traveling carriage 21 which is plyotally and slidably mounted at its rear end on the hortsontal being red 22 mounted in brackets 22', the said carriage, slidably supported at its forward end by the straight edge 23.

por feeding the carriage 21 across the record 12 transversely of the record groove, a nut 24 is secured at one end of the spring arm 25 which latter is secured at its opposite and to the carriage 21, the feed nut 24 being adapted to emgage a feed screw 26 mounted in the brackets 22' on the base of the machine. As is common in devices of this kind, the feed nut engages only the upper portion of the screw 26; so that as the carriage 21 is lifted at its forward end to remove the reproducer from the record, the feed nut disengages from the feed screw. For rotating the various feed screws in synchronism, each screw has secured thereto, a spiral goar 27 ongaged by a corresponding gear 28 secured to the shaft 15. The feed screw and gears 27 and 28 for one compartment are preferably identical with the corresponding parts for the other compartment, as shown; so that a uniform feed is obtained in all the machines employed in my invention. construction, however, is not necessary as my invention could be carried out by the use of feeds having any desired ratio to each other so long as two machines operated in synchronism. Each reproducer has secured thereto a sound conveyor 29.

In using the apparatus described above in carrying out my invention, the singer or other source of the sound to which it is sesired to give most prominence is placed facing the exit of the sound conveyor in one of the compartments, as at a in Pigure 1. The orchestra or other source or sources of sound is placed in front of the exit of the other sound conveyor, as at b in compartment 2. The record blank having been placed upon the

tables or supports 11 and the motor in the casing 14 having been set into operation, a director gives the signal through the window 4 for bringing the two sources of sound into time with each other. The rooms or compartments 1 and 2 being sound tight, the sound from the cource a and b are independently recorded upon the record blanks in the corresponding compartments.

When it is desired to reproduce the original production, the resultant records are placed upon the tables 30 (see Fig. 3) of a plurality of machines 31 driven in synchronism by any preferred type of connecting gearing 32. The reproducers 33 having been placed at the starting point of the various records each of the latter when rotated by its support causes the corresponding reproducer to give forth through the cound conveying arm 34 and the cound amplifier 35 into the atmosphere, the eounds which were recorded in the compartments $\underline{1}$ and $\underline{2}$. As the records are eynchronously rotated during both the recording and the reproducing, the various sounds are blended into the perfect harmony which existed during the process of recording. Furthermore, as the regularity of the undulations impressed in the record recorded in the compartment $\underline{1}$ is not destroyed by the superposition of the undulations from the sound in the compartment 2, the sound produced in compartment 1 can be reproduced with a high degree of distinctness. In addition to this advantage, the use of separate record grooves and reproducers greatly increase the volume of the sound given forth.

While I have included the claims for my invention in its broadest aspect in my companion application
referred to above and while I have included in this
application only such claims as are patentably different
from the disclosure made in the said companion application,
many modifications may be made in the specific structure
and in the method herein disclosed without departing from
the spirit of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

- to a device of the class described, the combination of a plurality of rotatable record supports, a sound box for each support, and means for rotating said supports in synchronism, each of said sound boxes having an interpetent sound conveyor connected therewith, substantially as set forth.
- 2. In a device of the class described, the combination of plurality of rotatable record supports, a sound box for each support, means for rotating said supports in synchronism, and means for producing a rolative feeding movement between said sound boxes and said supports, each of said sound boxes having an independent sound conveyor, substantially as set forth.
- 3. In a device of the class described, the combination of a plurality of rotatable record supports, a recorder for each support, means for rotating said supports in synchronium, and independent sound conveyors for the respective recyrders, substantially as set forth.

- In a derive of the class described, the combination of a plurality of compartments, a rotatable record support and a recorder therefor in each compartment, and ments for rotating each record supports in symphociam, substantially as set forth.
- 5. In a device of the class described, the combination of a plurality of compartments, a rotatable record support and a recorder therefor in each compartment, means for rotating one of said record supports, and means connecting said supports for synchronous rotation, substantially has set forth.
- 6. In a device of the class described, the combination of a parallity of concurrements, a rotatable record support and a recorder therefor in each compartment, means for rotating one of said record supports, and gearing connecting said supports for synchronous rotation, substantially as edit forth.
- 7. In a dayle of the class described, the combination of a plurality of compartments, a rotatable record support and a scorder therefor in each compartment, means for rotating one of said record supports, means connecting said supports for synchronous rotation, and means connected with said second named means for producing a synchronous feeding movement transversely of the record grooves between each of said recorders and its record support, substantially ag set forth.
- e. In a device of the class described, the combination of a plurality of compartments, a rotatable

record support and a recorder therefor in each compartment, means for cotating one of said record supports, goaring connecting Maid supports for synchronus rotation, and means connected with said gearing for producing a synchronus feedble movement transversely of the record grooves between each of said recorders and its record support, substantially as set forth.

- 9. The process of recording composite sound productions composed of sounce essenting from a plurality of different Sources which consists in simultaneously recording on separable symphronously driven record blanks the sound from each sources, substantially as set forth.
- to. The method of recording composite sound productions which consists in producing independent mechanical vibrations corresponding to the sound from each of several sources, and simultaneously disconnecting these vibrations in separate synchronously rotated record blanks, substantially as set forth.

west a blaim of the

This specification signed and witnessed this 28th day of march 191

Thomas & Edison.

Walitmenneth:

1 Frederick A. Backman

Oath.

State of New Jersey Ss.,

THOMAS A. EDISON . the above named petitioner, being bully sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Grange, Energy County, New Jorsey.

that he berily believes himself to be the original, first and sole inventor of the improvements in TALKING MACKINES

bescribed and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or nesdo before his invention or bescovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his indention or discovery thereof, or more than two gears prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said indention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 2 rd day of march 191/

Anna P. Klehm

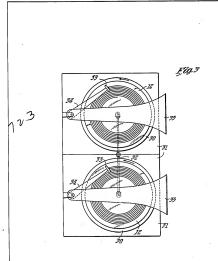
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Fig.1 , 170.2 Tite Alley.

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Witnesses: Straux Dewin Grederic Deckmann

Inventor:

by Suame to May

Div. ...23... Room .. 379.

PPD

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

May 3, 1931.

Thomas A. Edison,

C/o Frank L. Dyer,

Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application. Ser. No. 617,675, filed Ear. 29, 1911, for Talking Fachines.

The proper serial number should be given at the top of page 2. 3' is not on the drawing.

Claims 1 to 8 inclusive are drawn to a talking machine, while claims 9 and 10 are drawn to a process. Division is required according to the provisions of Bule 42.

In addition to the art cited in applicant's companion application applicant should see Davis, May 24, 1910, 958,730 (181-14); Prescott, July 26, 1910, 965,330 (181-16).

Examiner, Div. 23,

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, .)

TALKING MACHINES, ...

Scrial No. 617,675, ...

Filod March 29, 1911 ...

HONORABLE COMMISSIONER OF PATERTS,

SIR:

In response to Office action of May 3, 1911, please amond the above entitled case as follows: In line 1, page 2, after "Patent" insert

- Serial No. 617,674 - .

In line 4, claim 10, change "impressing"

to - recording - .

Cancel claims 1 to 8 inclusive and change the numerals of 9 and 10 to 1 and 2 respectively.

t. The method of recording sound vibrations simultaneously emitted from a plurality of neuroes which consists in conveying the vibrations from son of the consists in conveying the vibrations from son of the conveying the conveying the vibrations from the conveying the conveying the vibrations of the conveying the conveying the vibrations of the conveying the conveyin

Add the following claims:

separato recording instrument, and in simultaneously and synchronously recording the sound vibrations from the verious converses on separate synchronously driven record blanks, substantially as set forth.

The method of rocording composite cound productions which consists in causing the omission in separate sound-proof compartments of sound vibrations from each of a plurality of sound sources, in conveying the sound vibrations from each of the compartments independently of those from the other compartments to separate recording means, and in them cimultaneously and synchronously recording the different sets of sound vibrations on separate cyachronously driven record blanks, substantially as set forth.

REMARKS

The Examiner is respectfully requested to apply the reference numeral 2' to the drawings to indicate the bearing in the wall 2. for the shaft 15.

All of the claims now in the case are drawn to applicant's process; and action on the morito thereof is accordingly respectfully resuscied. The right is reserved to file a divisional amplication on the subject matter of the canceled claims.

Respectfully submitted,

Orange, New Jersey,

THOMAS A. EDISON,

April / 1912.

By Frank hy Cr.

9-200

Priper No4, Red.

J.H.D.-S. DEPARTMENT OF THE INTERIOR

η UNITED STATES PATENT OFFICE

May 13,1912,

Thomas A. Edison, Care Frank L. Dyer, Orange, New Jersey .

U.S. PATRAT OFFICE,

OFFICE AT 131912

MAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Talking Machines, filed March 29,1911, serial number 617,675 .

EBMSOVE, Commissioner of Patenta.

This action is responsive to the amendment filed April 9, 1912 .

Claims 1, 2 and 3 are rejected upon Hill, October 2,1900, #659,028, (181-2), and also as not patentably distinguishing from.

Maodonuld,October 21,1902, #711,706,(181-2); Jungren,June 20,1911,#995,656,(181-3), or Hobson,Eng. putent,June 15,1907,#13,658,(181-3).

Claim 4 is rejected upon the cited art. The degree of isolation: Of the performers is held not to be patentably material so far as applicant's process is concerned. Moreover, claim 4 is objectionable as defining the process by the apparatus employed.

IN THE UNITED STATES PATENT OFFICE.

TALKING MACHINES,)
Filed March 29, 1911,)
Sorial No. 617,675.)

HONOTABLE COMMISSIONER OF PATERES,

SIR:

In response to the Office action of May 13, 1912, please emend the above entitled case as follows:

Cancel claims 1 and 2.

Claim 5, lines 2 and 4, change "conveying the vibrations from each of the sources independently of these from the other sources" to - isolating the vibrations from one source from the vibrations from each soluted set of vibrations -; in line 6, sume claim, change "from" to - in -; and in line

Change the numerals of claims 3 and 4 to 1 and 2 respectively.

7, same elaim, change "seurces" to - sets - .

RENTARKS

Claim 1 differentiates from the references of record by specifying the step of isolating the vibrations from one source from the vibrations are mother source. In the disclosure of all the references, some of the vibrations intended for each recording instrument are permitted to commingle with and to become recorded with vibrations intended for other recording instruments. As the isolation of the vibrations as specified in this claim is the most important object of amplicant's invention, the importance

thoroof in applicant's process is obvious.

Claim 2 differentiates from the references by specifying the step of equating the estation in separate sound proof compartments of sound vibrations from each of a plurality of sound courses. The remarks made above in connection with claim 1 apply equally to claim 2. Referring to the Examiner's objection to claim 2, it is thought that there is no objectionable reference to apparatus in this claim. The expression "enuming the emission in separate sound proof compartments of cound vibrations ofc." states, it is submitted, a true process atop, the sound proof compartment being specified to facilitate an accurate description of this step.

The claims are thought to be patentable and reconsideration and allowance are respectfully requested.

Respectfully Subsitted,

THOMAS A. EDISON,

By Frank & Dyers

Orange, New Jersoy, April 24 1913.

PB-KCK

Paper Nos. Rej. .
All communications respecting this optication should give the seriel number, date of filling, and title of invention.

J.H.D.- Sut. DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

WASHINGTON June 3.1913.....

и с ратрит прис

Frank L. Dyer,

Orange, New Jersey

U.S. PATEMT OFFICE, JUN 8 1913 MAILED.

Thie action ie responsive to the amendment filed April 25,1913 .

Claime 1 and 2 are rejected on the references of record, in view of Tore, French patent, Feb. 16,1910, 412,688, (161-3).

Claims 1 and 2 are also rejected on the references of record for the reasons of record. The degree of isolation of the sets of sound vibrations is held patentably immaterial especially so far as the process is concerned. The process of the references of record is the same as that employed by applicant, see also Couade, French patent, Dec. 11,1907,384,981, (181-3). Attention is also directed to Wooster, Nov. 9,1909,939,781, (181-3), and merliner, Feb. 4,1902,682,803, (181-3).

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Patent Series Patent Application Files

Folio # 728 Sound-Box

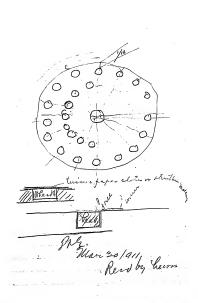
U.S. Patent #: 1078266

Primary Applicant: Edison, Thomas A

Date Executed: 4/3/1911

The object is to put weight douckly on the deces usteak of uduccky so as to make an Eurostafin over the whate deap Card board diaplorgm meigner down by lead pellets or shot set freely into resceptules in The diaph. The receptule may be corner

falling, our especially during shipmen



Patent Series

Patent Application Files

Folio # 731 Production of Nickel Hydroxid

U.S. Patent #: 1167484

Primary Applicant: Edison, Thomas A

Date Executed: 4/7/1911

Inter the her metter of the mon 1911 The abject of this invention is to chrapen the production of Michel hydroxids for use_ we alkalene Storage 6 allan The curation consests in Elementaling the tederes or. Expension weathery out of the products and reaction while in a semicoffordial oform + Dot the come time produce a porous hydrate more suitable for the u cae bacceri-This is done by ferst making a standardyrd Dalestion of Sodem hydrogade into which a slowdowdyed quantity off Michel Sulphate is poured

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Landlan Conditions Under those conditions of go cheaderds God you Ok go Can mo II, 12th

Er. Edison:-

This is the application which you instructed mo this morning to abandon. I cm writing this memorandum to make sure that I have explained the situation to you completely.

This application is one of three which were filed on the same day. The other two have gone to patent as follows:-

No. 1,083,355, for process of forming nickel hydroxide or other insoluble chemical compound by a certain dry method.

No. 1,083,556, for process and product for an active material made up of nickel hydroxide with a small persentage of cobalt hydroxide formed by drying the precipitated pulp and thereafter removing the insoluble reaction products.

In each of these patents there is a reference to the application now under consideration, and I consider that the process of the present application is substantially disclosed in patent No. 1,063,556. Opples of these patents are submitted hereith. If I am correct in this opinion, you will not be able to keep the process of the application under consideration secret by abundanting it.

Very good process claims have been allowed in this application, and the only question remaining to be sattled is that of the product claims. In view of these circumstances, I should think it would pay you to take out this patent even with only process claims in it, as this would afford you a certain measure of protection at least. In our last amendment, we asked for the allowance of six product claims. Possibly, if we reduce the number to, say, three, and change the form of some of them, we may get something allowed on the product, and I should recommend making an effort to get at least such product claims allowed as can be obtained without going to the expense of an appeal.

If you should change your docision in this matter, we will have to act promptly as the amendment must be received in the Patent Office not later than June 16th. An amendment for this purpose has already been prepared and is ready to be mailed.

While I agree with you that it is difficult to prove infringement of patents of this character and that in many cases better protection is obtained by keeping the process secret, I do not think this consideration is applicable to the application under consideration because of patent No. 1,083,356 referred to above, which has already been published.

Henry Lanahan

HL-JS

Patent Series Patent Application Files

Folio # 732 Storage Battery

U.S. Patent #: 1083356

Primary Applicant: Edison, Thomas A

Date Executed: 4/7/1911

July Revolut Junin 19 consectained but I is The affect of this invention probable that I aclo to wares the seasonacle uf welcher vox le to Calytilically to alters hephysical dructure otore oxygen relevise Callem -The proper amount of Color ourshate is edes to the nickel The invention course in suppliate delection to shaund from 12 To 3% of Colact hyDroxde some we night percentage John Municipally mixed cotell the the corparite White to a higher party dieus thi/ This colil is that alowly added than of without the Colore to a Slandardy Dolulin hyproxide The reason cef Dadum hydroxide -Wer not as yet seen allokile agriated, solkal

when the reaction Claim - Wickel hydroxida Completed there is NaOH - The pulp is dried slowly with a part or all afthe products chelhydnoude coule of the waston which a successence of lengerally Dadum Sulplate Cobalt hydroxide made after drying The whole of be preceptaling the Salts at these welals the gravelar pocuder i washed we a percolator Logreller ay an alkali be weeter until only learning a portion or acle of the products afthe a trace affel shales or Dada remains - / secation in the puls the Dowden is them drived during the puls anchested to age is westing out the tubes a fee 6 acting love of use aform

Claim on a Calley with this know a Cally, 4 fordally Eta Eta

Patent Series Patent Application Files

Folio # 733 Art of Forming Chemical Compounds

U.S. Patent #: 1083355

Primary Applicant: Edison, Thomas A

Date Executed: 4/7/1911

powers very rapidly. The Water of Cryslatization of the makel sulphate The abject of this unrention Serving to harsten the is to Cheapen the production reaction & make a Tough of hickel hydroxide for dough like maning use in alkaline plonage They mass is dried very slowly - Then the whalk is Graphe up put in a The mornhon consists in persolator + the products despensing with the water derention washed out of preceptation which of the secultary hydroxide what 62 subsequently dried, when I de ready t Brugung Logaller der for use - for ballorus It to best to have a consideral Donaties makel sulphate Execute ackali to render and dry Sodmen by roxiko the hyporoxile more porous in the perceper proportions of mysing the same in a line This without is not alone useful for forming tally The machon Taking makelhydraxide Get is place between the dry

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Patent Series Patent Application Files

Folio # 743 Art of Separating Copper from Other Metals

U.S. Patent #: 1050629

Primary Applicant: Edison, Thomas A

Date Executed: 5/1/1911

Tegal March 24 1911 Datend 2 The alexal of this invention is to seimour capper from the Composite sheets of atternally Electroplated sheets ex Capper and wekel to form, takes at nichel for use in an alkaline Storage ballony more particularly duranted in and also palene No 115617 which distribes the process Lermenly used to desalve lout the Copper between the makel-

The uverlin consect in the deservery that

Mutallie Copper is rapidly desalored by a strong sotution of Sulphate of ammonia, containing a small quantily celling Cuprice Chronicle and 1 that the rapedaly ceforalition is increased very considerately Cognicating the Laculing while the reaction goes The products from the Solution afthe welcalie Copper is of basic sulphate of Copper, which is weathable in the light of is held in suspension by the olivring,

anmong which must be regerated from the solution wheele It satural rodgand also the Copper lacef must be sugaranted The whate making an Expension Complicated of disagrecable process as The ammonia Valution Connect 62 heated 4 air must reach The Satution to www. solution af the Copper

to be the with feel of the beat of the by this with feel on the colno fumes de aumina promptate (+ no free ammour is used The cocution is dyfilly weid + the Capper automatically is thrown aut as an modurable basis sulphate hence the Colution can be used Continuously Gy fillering off the basic palt-+ adding a small grantity afford afford of aumoney

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this application

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Legue Dept To each Liter of Solution 2850 Ammonium albhale 16 ga Conservelloride

Patent Series

Patent Application Files

Folio # 745 Art of Separating Copper from Other Metals

U.S. Patent #: 1050630

Primary Applicant: Edison, Thomas A

Date Executed: 5/12/1911

25% Solution Sulphate Capie, & alcout 15 gruns Mork or less es Cupie Chloride. Salutem Kept near Coclering d'out aur passed Bassa Sulphate Yours,

the basic lulfhate of fitted aff to pune a to be fort & dek to Cusuff

by adding sulce

This Raculin disalors meCaller Copper more rapidly than by warmy notysoz of Cuchz as my applich -+ Is charges as in the Latter Casa Olumany Autophata must be supplied Coberno en the morte only the cheapex Suphwere aread need be used tales has the advoulage that their Genera no

tracocci fore annuam in lessolations in the hy

The Chair say that the selection decaded in F743 is skylety and, there of from the formal frame of fry the Received from Mr. Echeson, agric 27,1911 H.L.

Patent Series Patent Application Files

Folio # 748 Reproducer

U.S. Patent #: 1055621

Primary Applicant: Edison, Thomas A

Date Executed: 5/16/1911

Surveiter - Reproduced by Really & Shewing 1911 Really 1911 Really

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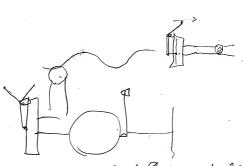
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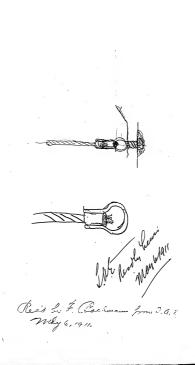
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Ched by J. Gachman from J. a.s. may 6.1911.



Marky by F. Clarkmann May G. 1917

Patent Series Patent Application Files

Folio # 756 Battery Charge Indication

U.S. Patent #: 1045291

Primary Applicant: Holland, Walter E

Date Executed: 6/6/1911

1645

MEMORANDUM

Mr. Smith:

12/29/10.

Referring to the attached memorandum, please get an extra copy of the Apple patent so that I can take it up with I do not think it would be worth while going into this matter unless we bought the patent, assuming that it is infringed.

FID/IWW

Enc-

Miss K- Please order Office 932057 - one copy.
Gauss

Dec. 29, 1910.

Mr. Dyer:-

Mr. Edison's, or rather Mr. Walter Holland's invention on the device for indicating when a storage battery is nearly fully charged by means of counting the bubbles of gas passing through a fluid reservoir per second, is anticipated by the patent to Apple, No. 932,087, in the Storage Battery Binder, which I hand you. You will note that Claim 2 of this patent dominates our structure. Will you please advise me whether you think any steps should be taken to purchase the Abule matent.

Our structure is much more practical than Apple's, and I think we might file a specific application on our improved apparatus. As to the idea of indicating the condition of the charge directly by a pointer and a scale, on which I developed several ideas, as I told you, Mr. Edison says that they had tried similar schemes and found them impractical on account of the clogging of the passages with the potamh from the battery solution. However, I should think we might file applications on some such ideas.



Patent Series

Patent Application Files

Folio # 755 Method of Making Molds for Sound Records

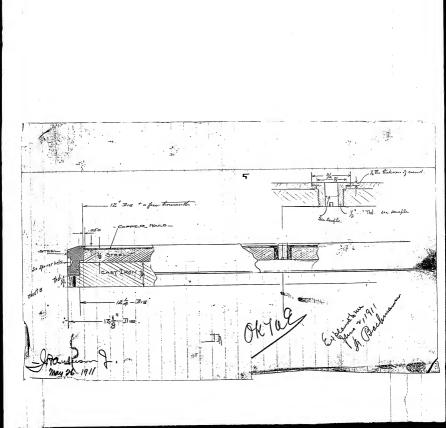
U.S. Patent #: 1118114

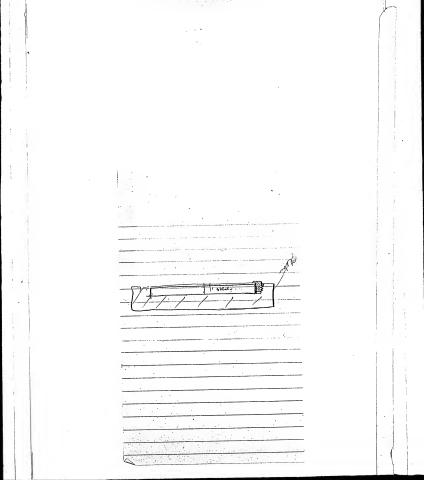
Primary Applicant: Edison, Thomas A

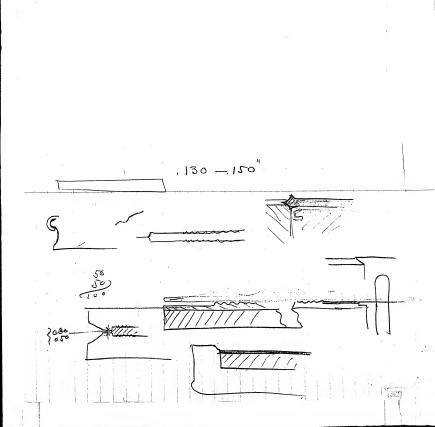
Date Executed: 6/8/1911

the the great pressure necessar Improvement in metall to unpleas the second on master sucord for woulder aplactic material This plante due madrali inform contour and the course of some of the noises heard . Herstofors the Their electrolyse when the sucond o softom the wax record has supera direct been backed up by a thick metal disc The Buthe morel on the necessary two being secured by solding affinedumy the whole of Ob two oupposes logather There are afgrictionable feature is done away with in seaumy the two logelher The Electrolype of the record Capsoldering as he madely is feed with the soft malarial Ebery Come les soldens a We Edgas secured to wholde co cenever which secult by screed - It is them I would in producing an uneven the document purpage to che welles Moder when subreled 62 secured is also turned

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Patent Series Patent Application Files

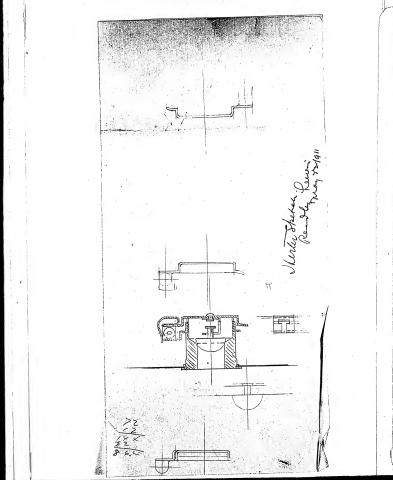
Folio # 757 Combined Filling and Gas Valve for Storage Batteries

U.S. Patent #: 1165100

Primary Applicant: Holland, Walter E

Date Executed: 6/15/1911

get from Herter the new



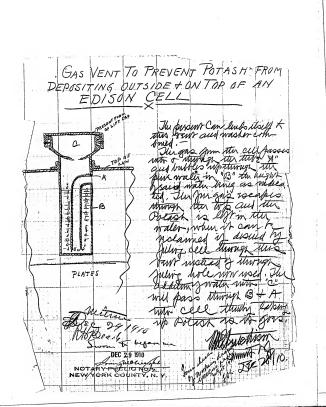
Patent Series Patent Application Files

Folio # 759 Safety Device for Secondary Cells

U.S. Patent #: 1116893

Primary Applicant: Hutchison, Miller Reese

Date Executed: 6/19/1911



DEVICE TO PREVENT FLAME OR HIGH TEMPERATURE GASES IN A VESSEL FROM BEING DISCHARGED INTO A CONNECTING CHAMBER AT SUCH HIGH TEMPERATURE ASTO IGNITE INFLAMMABLE



When it becomes advisable to connect a number of cells of talling to one common exhaust give to cangoff the pass give off in charging to, as is almostly but many practice it homes necessary to or private the system that an explision of any man any ne of the citie, or in the several cells, so not ornamed the own

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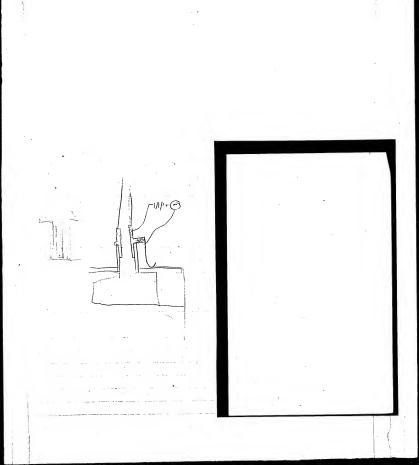
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Mr. Hutchison:

I hand you herewith the file of folio 759, which is an application filed in your name for Safety Devices for Secondary

application filed in your name for Safety Devices for Secondar Cells. This application was allowed August 7, 1914 with the following claims:-

- 1. In appearatus of the character described, the combination with a battery cell, of fluid-containing means for extinguishing the fleme of an internal explosion in said cell, and means for indicating the cocurrence of such explosion, comprising a member adapted to be displaced to operative position by passage of gas in excess of a predetermined pressure through said fluid-containing means, substantially as desorbed.
- combination with a battery cell, of a fluid-containing vessel so commerted with said cell as to cause the passage of gas therefrom into said vessel below the fluid-level of the same, and a pivoted cover for said vessel.
- 5. In appearance of the otherector desorthed, the combination with a battery cell, of a fluid-conteining vessel so connected with said cell as to cause the passage of gas therefrom into said vessel below the fluid level of the same, and a sowahed the companion of the comyrepsure within said vessel.
- 4. In apparatus of the character described, the combination with a bettery cell, of a full-d-containing vessel so commerced with said cell as to cause the passage of gase, therefrom into said vessel below the full-lower located and private cover moved into open position by excess of gase pressure within said vessel, and a spring so formed and positioned as to coart with said cover to resiliently hold the same in either closed or open position.
- 5. In appearatus of the character described, the combination with a battery cell, of a ressel fitting closely within the filling lopening of the same and provided with an exterior opening and an opening extending from the interior thereof into the space above the electrolyte in the said cell, and a removable cover for the exterior opening.
- 6. In apparatus of the character described, the combination with a bettery cell, of a fluid-containing vessel mounted within the same, having a passage therefrom extending out through the top of the cell, seld vessel having a vertical slaeve extending downwardly therein from an upper surface to a plane shove the bottom of said vessel, said sleeve surrounding the lower end of said passage, and said vessel having of counferential openings connecting the space above the electricity in said cell with the interior of said vessel of the same countries of the same.

The epecific structure covered by the claims is that of Figure 1 and there are no claime to the filling device shown in Figure 2. This device ie not much different from that shown in the Edison patent No. 821,623 of May 29, 1906. I also note that no claime have been precented covering the idea of insulating the eafety device from the battery can. Apparently, the only function of thie ineulation is to facilitate the operation of the signal aesociated with the filling device, and you have already told me that the filling operation cannot be performed estisfactorily in the manner illustrated in Figure 2 because there is no vent for the escape of air. Do you consider this insulation feature of importance? Possibly, a claim can be obtained on it by an amendment under Rule 78, or if it is of sufficient importance, the case might be permitted to forfeit and then renewed. If you think the invention is sufficiently protected by the claims allowed and recommend taking the patent out, I should like to have Mr. Edison's authorization to pay the final fee. I presume no foreign applications are to be filed. you consider any of the details shown in figures other than Figure 1 of sufficient importance to justify the filing of a divisional ap-

HL-JS

Patent Series

Patent Application Files

Folio # 768 Concrete Furniture

Serial #: 639752

Primary Applicant: Edison, Thomas A

Date Executed: 7/18/1911

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To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON a citizen of the Cinited States, residing and having a Post Office address at

Llewellyn Park; West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

CONCRETE FURNITURE

set forth in the annexed specification; and he hereby appoints Frank L. Wyer (Registration Bo. 560), of Orange, New Jersey, his attorney, builf full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent office connected therebuilty.

Thos. A. Edison

SPECIFICATION

TO ALL WHOM IT MAY COUCERN: -

BE IT KHOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, Essex County, New Jorsey, have invented certain new and useful improvements in CONGRETS FURNITURE, of which the following is a specification:-

My invention relates to the use of concrete for articles of furniture, and has for its objects the production of material suitable for this purpose, which is fire-proof, cheeper than wood, and not subject to many of the deteriorating influences which affect wood, and the provision of means for assembling and securing together the parts made of this material so as to form the completed article. More particularly, my invention relates to an improved phonograph cabinet constructed of reinforced concrete.

My invention consists generally in the use of concrete made of cement, preferably Portland, mixed with very light porous sand or other aggregates, such as pumice stone, charcoal, coke, or furnace slag made porous by steam or other gases being blown through the molten mass, and reinforced in a suitable manner, as by metallic perforated sheets or wire screen cloth. The pores of the porous aggregates are preferably of such small dimensions that the cement particles cannot enter them, and thus, the greater part of the bulk of the concrete, after it has

herdened and the water has been driven out, consists of air spaces. Thus, by employing porous aggregates having a loose, epongy, or callular structure, I have been able to produce a concrete which is only a little heavier than wood and which is admirably adapted for the purposes desired.

The articles of furniture, if large, are preferably made in separate pieces, and means are provided for assembling and securing the pleces together, as, for example, by metallic parts molded in place in the separate pieces, so that upon assembling the pieces, they may be bolted together.

To show the manner in which my invention may be carried out, I have illustrated it as applied to the construction of a cabinet for phonographs, but obviously, my invention is applicable to furniture of all kinds.

In the drawings which accompany and form a part of this specification, and in which like reference characters are employed to designate like parts in the several views -

Figure 1 is a vertical sectional view of a phonograph cabinet constituting one embodiment of my invention;

vention;

Figures 2 and 3 aro perspective views showing certain details of construction;

sin details of construction; Figure 4 18 6-section on the line 4-4 of Figure

1;
Figure 5 is a view partly in section showing a portion of one of the cabinet pieces or parts at a stage in its construction immediately after the reinforcing

20

26

material has been laid in place; 4/2/14

Figure 6 is a sectional view showing one form of a portion of a securing device;

on of a securing device;
Figure 7 is a sectional view showing a modified form of a portion of the securing device; and

Figure 8 is a sectional view through a hinged portion of the cabinet.

Referring to the drawings, at $\underline{1}$ is illustrated one of the two side pieces or parts of the cabinet. The front piece or part of the same is shown at 2, and the back piece or part at $\underline{3}$. The top member or frame in shown at 4 resting upon and supported by the frame formed of the side pieces $\underline{1}$ and the front and book pieces $\underline{2}$ and $\underline{3}$. The lid of the cabinet is shown at 5 and is hinged to the top piece 4 at 5'. Horizontal partitions or shelves are shown at 6, 7 and 8. The side pieces 1, front and back pieces $\underline{2}$ and $\underline{3}$, top piece $\underline{4}$, 11d $\underline{5}$, and horizontal partitions or shelves 6, 7 and 8 are made of concrete which is preferably composed of Portland cement mixed with very light porous aggregates, such as pumice stone, charcoal, coke, or furnace slag, made porous by steam being blown through the molten mass, and reinforced by metallic perforated sheets or wire soreen cloth, such as is shown at $\underline{9}$. Fortions of the molds or forms for forming these parts into suitable shapes are shown at 10. Each of the side portions l is preferably formed with a pair of metallic tubular members 11 located near the edges of the side pieces which are vertical when in assembled position, thus providing vertical members at each corner of the main frame. Each of the tubular members preferably projects a short distance

above the main frame at each corner thereof, as ie clearly shown in Figure 3. The lower ends of the tubular members 11 serve to receive the rollers 12 of the cabinet. top piece 4 is provided at each corner with a recess adapted to receive the projecting upper ends of the members 11 at each corner of the frame, and means is thereby provided for retaining the top member 4 in place on the main frame. In order to secure the pieces of the cabinet togother, means are provided, as illustrated particularly in Figures 4, 5 and 6, consisting of bolts 14, nuts 15, washers 16 and 17, and metallic angle irons 19. The method of providing the securing means is as follows:-A pair of washers 16 and 17 are placed on each side of one of the interstices of the reinforcing fabric 9 and the bolt 14 threaded through the washers and the opening in the reinforcing fabric. The nut 15 is then screwed in place, and the reinforcing fabric, together with the bolt and its nut and the washers, are all set in place in the plastic maes of concrete, as is clearly shown in Figures 4, 5 and After the concrete has set, the bolt 14 is unserowed from its nut and from the hardened concrete. At any time thereafter, the bolt may be sorewed into the nut for the purpose of retaining in place one of the angle irons 19.

In the modification shown in Figure 7, the bolt 20 is set in place with its head embedded in the congrate. In this figure, 21 and 22 show weahers for the bolt on each side of the reinforcing fabric 9. In using this modification, the angle iron 19 is secured in place by means of a nut screwed on the bolt 20. The side pieces 1 and the ond places 2 and 2 may be east in such a form as to join togeth-

er in a suitable manner, as is shown at 23, for the purpose of increasing the rigidity of the structure. The side pieces 1 are preferably molded with projections or ledges 24, 25 and 26 which serve the purpose of supporting the horizontal partitions or shelves 6, 7 and 8 respectively. For the purpose of eccuring hinges to those parts which are to be hinged together, wooden blocke 27 are molded in the pieces or parte, and the hinge 28 is secured to the wooden blocke 27 by means of screws 29, as is clearly shown in Figure 8. A door 30 is provided in the upper portion of the phonograph cabinet to furnish easy access to the phonographic apparatus which is contained in the cabinet. The top partition or shelf 6 is provided with an opening 31 through which the neck of the phonograph horn passes. The front piece 2 is provided with an opening 32 in its upper part intended to afford an outlet for the sound produced by the phonograph, and with an opening 33 in ite lower end which may be provided with a door. The lower part of the cabinet may be used for any euitable purpose, such as storing records.

The features of construction described in connection with the phonograph cabinet may obviously be applied
to other forms of household furniture and articles of like
character. The articles after hardening and drying may be
varnished over or painted in a suitable manner, either plain
or in imitation of wood. If desired, the articles may be
japanned by the methods employed in japanning iron articles,
inasmuch as the concrete is not affected by the heat at the
temperature employed in japanning ovens.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:-

- t. A composition of matter, consisting of concrete composed of common and porous aggregates, substantially as described.
- 2. A composition of matter, consisting of concrete composed of Portland cement and porous aggregates, substantially as described.
- 3. dosposition of matter, consisting of concrete composed of coint and pumico stone, substantially as decoribed.
- 4. A demposition of matter, consisting of concrete composed of Portland cement and pumice stone, substantially as described.
- A composition of matter consisting of concrete composed of cement and porous aggregates, the pores of the aggregates being substantially free from cement, substantially as described.
- 6. A composition of matter consisting of concrete composed of Portland dement and porous aggregates, the pores of the aggregates being substantially free from coment, gubstantially as described.
- 7. An article of furniture composed of reinforced concrete consisting of cerent and porcus aggregates, substitutially as described.
- 8. An article of durniture composed of a plurality of pieces of reinforced conducts consisting of cement and porous aggrogates, substantially as described.

Timedel 8/2/3

9. An article of furniture composed of a plurality of pieces of reinforced concrete, the said pieces being provided with means for securing the same together, substantially & described.

- In an article of furniture, separate pieces of reinforced concrete, and means for securing the same together, substantially as described.
- 11. In a phonograph cabinet, side pieces, front and back pieces, and a top piece, some of said pieces being of reinforced concrete, questantially as described.
- 12. In a phonograph cabinet, side pieces, front and back pieces, and a top piece, all of said pieces being of reinforced concrete, substantially as described.
- 13. In a phonograph cabinet, a main frame of reinforced concrete and provided with members projecting .

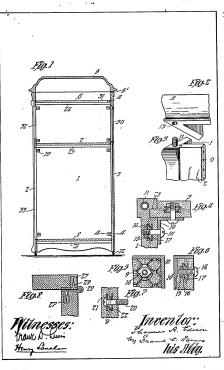
 upwards at its upper corners, an upper frame having a

 11d and provided with means for engaging the said projecting members, substantially as described.
- vertical front and back places, at op piece, and horizontal members, come of the earl vertical members being provided with projections for supporting the horizontal
 members, all of said pieces and members being of reinforced concrete, substantially as described.

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This specification signed and witnessed this 18th day of July 190/ Thos. A. Edwan Mitneageg: 1. Henry Lanahan 2. Orma P. Kehm Oath. State of New Jersey ss., County of Essex , the ahone nameh THOMAS A. EDISON petitioner, being buly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orango, Essex County, New Jersey that he verily believes himself to be the original, first and sole inventor of the improbements in CONCRETE FURBITURE described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country. Thos. A. Educon

Shworn to and subscribed before me this 13 dd day of July 190/ [Seal] Qotary Bublic.



5.74

2-200

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Aug. 24, 1911.

Thomas A. Edison,

C/o Frank L. Dyer,

Orangs, N. J.

Please find below a communication from the EXAMINES in charge of your application.

Serial No.639,752, filed July 21, 1911, for Concrets Furniturs.

S.BMsore!

This cass has been examined.

Claims 1 to 6 inclusive are for a composition of latter. Claims 7 to 14 are for an article of furniture, and a phonograph record cabinet, specifically. Applicant is required to divide, limiting his application to one of these groups of claims; each being for asparate and distinct subject matters.

As showing the state of the art after a oursory ex-

amination see

Price, 948,770, Feb. 8, 1910, Tables; English Pat, 2,027, of 1874, Chains; Hills, 903,977, Nov. 17, 1908, D.R. Enclosed; Kaltz, 916,326, Mar. 23, 1909, " "

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison
CONCRETE FURNITURE
Filsd July 21, 1911
Serial No. 639,752

Room No. 131.

HONORABLE COMMISSIONER OF PATENTS.

SIR:

In response to the Office action of August 25, 1911, please amend the above entitled application as follows:-

Cancel claims 1 to 6 inclusive, and substitute therefor the following claims:-

Canceled 9/2/14

- An article of furniture having parts consisting of concrete composed of coment and percus aggregates, substantially as described.
- An article of furniture having parts consisting of concrete composed of Postland cement and porous aggregates, substantially as described.
- An article of furniture having parts consisting of concrets composed of essent and aggregates of pumics stone, substantially as described.
- 4. An article of furniture having parts consisting of concrets composed of Portland coment and aggregates of pumios stone, substantially as despribed.

- An article of furniture having parts concieting of concrete composed of edment and porous aggregates, the porce of the aggregates being substantially free from commont, substantially seldescribed.
- An article of furniture having parts consisting of concrete composed of routland coment and porque aggregates, the pores of the aggregates being substantially free from coment, substantially as described.

Add the following claims:-

- 15. In an article of furniture, a piece or member of reinforced concrete having funtoning means extending through the reinforcing, whereby the reinforcing essists in retaining the fastening means in place, substantially as described.
- 16. In an article of furniture, the combination of a piece or member of concrete, an internal server threaded member embedded therein, a perforated member, and a server or bolt extending through the perforated member and threaded into the internal server threaded member to easure the perforated member to the place or member of concrete, substantially as described.
- 17. In an article of furniture, the combination of pieces or membere of concrete, each having an internal sorew threaded member embedded therein, a perforated member for connecting the pieces or membere of concrete together, and sorewe or holte extended through the perforated member and threaded into the internal sorew threaded members for ecouring the connecting member to the pieces or members of concrete, substantially as described.

bureled s/1/13

18. A cabinet having vertical members or pieces of concrete, vertically disposed tubular members modded thorein, and rollers for the cabinet mounted in the lower ends of the tubular members, substantially as described.

29. A onbinet kering vertical membors or pieces of concrete, vertically disposed tubular membors molded thereand explanation of the conference of the conf

Canceled 1/2/13

20. A cabinot having vertical members or pieces of concrete, vertically disposed tubular members molded therein, a top piece or newher having recesses adapted to receive the upper ends of the tubular members, whereby the top piece or member is positioned, and relieve for the cabinot mounted in the lower ends of the tubular members, substantially as described.

REMARKS

The requirement for division has been complied with by the cancellation of claims 1 to 6 inclusive. Applicant reserves the right to file a divisional application on the subject matter of these claims.

The new claims subditted are believed to be properly oxaminable with original claims 7 to 14 inclusive.

Action on the merite is requested.

Respectfully submitted,

Orange, New Jersey,

By Frank L. Diger

July 24th, 1912.

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9-900

ESB

Div.8.... Room131 Attens selp mediationer of Patents shipsion, D. C."

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE WASHINGTON

Thomas A. Edison,

Auguet 5, 1912.

c/o Frank L. Dyer,

34 0 1917

ICL.

Orango, N. J. Please find below a communication from the EXAMINER in charge of your application.

Amendment of July 25, 1912 ie of rooord.

- #639,752 filed July 21, 1911 for Concrete Furniture.

Claims 1, 2, 3, 4, 5, 6, 7 and 8 are rejected as aggregations as the particular character of the cement used in no way occoporates with the structure of the furniture. The compoeition of the cement ie in itself subject matter of invention. See Lande 299,810, June 3, 1884 and Parchall 323,722, Aug. 4, 1885, class 106-241.

Claims 1 to 8, inclusive, are rejected as met in terms by Prico of record in view of Parchall and Lande cited.

Claims 9 and 10 read directly upon Price of record and are rejected.

Claims 11 and 12 are rojected on Keltz or Hills of record in view of Price. To construct the cabinet of Keltz or Hills of cement would be suggested by Price.

Claims 13, 14 and 19 are rejected on Faust 835,508, Nov. 13, 1906 or Myore 252,053, Jan. 10, 1882. Book cases, Knook Down in view of Price. All applicant has done is substitute coment for wood in Myers or Fauet which would be suggested by Price. To imbod member D of Myers or F of Faust in cement is not invention.

Claims 18 and 20 do not distinguish over the above references and reasons and moreover are aggregations as the casters do not cooperate with the other structure set forth.

Claims 15, 16 and 17 are rejected on Reinle 701,516, June 3, 1908, or Paulle, 760,606, May 24, 1904, show cases, in view of White 875,596, Dec. 31, 1907 or Craig 977,710, Dec. 6, 1910, Class 78-105.

See also Donaldsen 641,942, Jan. 23, 1900 and Smith 507,562, Oct. 31, 1893, Claus 72-20.

To substitute easent for the material, glass, used in Faullė or Reinle using the bending means of White or Craig would not involve invention.

All the claims are rejected.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
CONCRETE FURNITURE,)
Filed July 21, 1911,)
Sorial No. 639,752.)

HONORABLE COMMISSIONER OF PATENTS,

SIR:

claim 10.

In response to the Office action of August 5, 1912, please amend the above entitled case as follows:

Cancel claims 9 to 13 inclusive.

Claim 14, line 4, after "with" innert

integral - : renumber this claim as claim 9.

Cancel claims 15 to 18 inclusive.

Claim 19, line 3, after "in" inpert

and extending thereabove - : renumber this claim as

Cancel claim 20.
Add the following claim:

At. In an article of furniture, the combination of a piece or member of reinforced concrete, a pair of washers embedded in said piece or member, one washer on either side of the reinforcing, an internal screw threaded member embedded in said piece or member adjucent one of said washers, and a screw or bolt threaded through the washers and the reinforcing and into said internal screw threaded member, said screw or bolt being partially embedded in said piece or member and extending outwardly thereofrom, substantially as described.

-

REMARKS

It is submitted that claims 1 to 8 are not aggregations as they morely describe an article composed of a cortain material or an article having parts or pieces composed of such material. There is cortainly no aggregation of elements in any of these claims. The issue with respect to these claims should apparently be whether

invention is involved in making an article of furniture. or parts theroof, of the special kind of concrete specified. Applicant strongly contonds that the use of such a concrete for this purpose does involve invention. In the first whice no reference has been cited which discloses an article of furniture constructed of concrete consisting of cement and porous aggregatos. Moreover, no reference has been cited which even discloses a concrete consisting of cement and porous aggregates. In the concrete disclosed by both Parshall and Lande of record, the pumice stone and slag are pulverized or reduced to a fine powder and do not exist in the concrete as porous aggregates. A concrete such as disclosed in these patents would, therefore, be very heavy and compact and its use in the manufacture of articles of household furniture would be impracticable as such articles would be entirely too heavy and cumbersome. The combining of the cubstances as described by Parshall results in a material of stiff consistency which is not capable of being poured . . as is the case with the concrete mixture disclosed by applicant, but is applied with a trowel or the like. The fine pulverizing of the pumice stone of Parshall's compacition and the slag of Lande's composition serves to destroy the porous etructure thereof and rendere it impossible to obtain a concrete of the requisite lightness. The concrete of Lande is

adapted for use only in making heavy articles such as the park bench disclosed by Frice and not for articles such as household furniture which are frequently moved from place to place. As set forth in the last four lines of page 1 and the first six lines of page 2, the greater part of the bulk of applicant's concrete after it has been hardened and the water has been ariven out concists of air spaces and such concrete is only a little heavier than wood. As the Examiner is doubtless aware, those are numerous decisions to the offset that where the substitution of one material for another results in a superior product and simplifies and cheapens the manufacture of such product, such substitution amounts to invention. The following extracts from lecisions on this point are cited by way of example:

" "The substitution of one material for another may amount to invention where a superior product resulte from the substitution." Eureka Blotter Bath Company vs. Nicholas et al. 157 F. 556.

"The use of a different material in constructing an article previously patented involves invention where it produces a useful result, increased efficiency, or a secised scring in persons."

10 of 10

"The substitution of one material for another involves invention where the substituted material to used in a relation in which it had not before been used and in which it accomplished new and very beneficial results."

19 F. 505.

The use of applicant's concrete as described results in an article of furniture which, while only a little heavier than wood, is much atronger and more durable than wood. Moreover, the manufacture of much articles is rendered much simpler and cheaper than where wood is used.

Claim 9, (former claim 14) as now presented, is believed to clearly differentiate from Faust, Myers and Price of record. | None of these patents discloses vertical members of roinforced concrete provided with integral projections for supporting the herizontal members. Moreover, none of those references discloses a phonograph cabinet.

. Claim 10 (former claim 19) olcarly distinguishes from the reforences of record by specifying that the vortically disposed tubular membors are molded in the vortical members of concrete and extend thereabove, and that the top piece is provided with recesses adapted to receive the upper ends of the tubular members whereby the top piece is positioned. By the construction described in this claim, the cabinet may be much more easily assembled than the structure disclosed in either Faust er Myers.

New olaim 11 presented horewith is drawn specifically to the construction and arrangement of the securing moans provided in each of several members of the cabinet described in the specification, whereby those members may be readily secured tegether. This claim is believed to be clearly natentable over the references of record.

For the above reasons, further consideration and allowance of the claims as now presented are requested.

Respectfully submitted,

THOMAS A. EDISON

Orange, New Jersey, August 2, 1913.

WAH-KCK

Div.33. Room70

Abbrework

The Commissioner of Patents,
Washington, D. D.**

2-200 CMR/AHS Paper No. 6 (Red.)
All communications respectible this
should give this serial number,
and while, and title of invention.

DEPARTMENT OF THE INTERIOUNITED STATES PATENT OF

SEP 13 1913

WASHINGTON

Sept. 13, 1913

Frank L. Dyer,	
Orange,	

Please find below a communication from the EXAMIRER in charge of the application ofThomas A...Edison, #639,752, July. 21, 1911, Qonaxets Eurniture.

Commissioner of Aug. 4, 1913.

Responsive to amendment of Aug. 4, 1915.
This came is examined de nevo in this Division.
The following new reference in cited:::
Reinstein (B-ttish) 25,100 of 1909, 155-Chairs.
It is believed that the use of a concrete of a particular

kind instead of the ordinary concrete 's an obvious substitution of materials and nothing more. If it is desired to make an article of furniture light, it would not be invention . to choose any of the old and well known aggregations, such as ground slag, pumice stone, instead of stone. Whether such aggregates be whole or ground is not regarded as a matter of patentability at all, but of choice. The ground pumice stone or slag certainly " /1 not lose materially its property of lightness, that is, the specific gravity thereof would not be materially affected by grinding, because it is considered the pumice stone in its divided state would still be porous, that is, every particle thereof no matter how small would still be honeycombed. It is believed the only way whereby the speoif io gravity of such substance could be materially increased would be by great compression. Thisis true of ground coke in the manufacture of electric light carbons. It is not seen

why the same could not hold in a similar substance, as pumice stone.

Furthermore, it is not believed necessary necessary to show an article of furniture made of porous aggregate and cement, for the reasons that aggregates of such composition are old in the references of record, and for the reason that furniture has been made of paper or papier mache, concrete, or stone-like compositions, as may be seen in the English patent to Reinstein, or Price of record.

Claim 1 is therefore rejected on Price, of record, or upon the new reference to Reinstein, in view of Parshall or Laude, of record.

Claims 2, 3, 4, 5, 6, 7, and8 are rejected upon the same references. It is bolieved that applicant has nothing patentable in the use of this particular kind of composition in an article of furniture over ordinary concrete, and that the invention lies in the composition per se or in the specific structure of the article itself

Claim 9, as amended, fails to define anything patentable over the claim as originally presented and it is therefore rejected on the references of record for the reasons of record.

Claim 10 is rejected upon the same references.

Claim 11 is not believed complete. The member which coacts with the screw or boilt to provide an attachment or connection with other adjacent pieces should be set forth.

The claim may then be allowed.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

CONCRETE FURNITURE

Room No. 131

Filed July 21, 1911

Serial No. 639,752

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of September 13, 1913, please amend the above entitled case as follows:-

Fage 2, line 24, after "are" incert - enlarged -.
Line 26, cancel "a election" and incert - en enlarged electional view - . Line 28, cancel "a", first occurrence, and
incert - an enlarged - .

Page 3, linee 2, 4 and 6, cancel "a", first cocurrence, and incert - an enlarged.-.

Page 4, line 4, after "recees" insert - 13 - .

Cancel claims 1 to 10 inclusive and renumber

claim 11 as claim 1.

Add the following claims: -

2. The combination of a piece of reinforced concrete, a perforated member embedded in eald piece adjacent the reinforcing, an internal screw threaded member imbedded in said piece adjacent the reinforcing, and a corew or belt extending through said perforated member and the reinforcing and threaded into eald internal corew threaded member, eald corew or belt extending outwardly from eald piece, outstantially as described.

- 3. The combination of a piece of reinforced concrete, a perforated member embedded in said piece adjacent the reinforcing, and a screw or bolt extending through said perforated member and the reinforcing and having one and portion disposed within said piece and the other end portion extending outwardly from said piece, the end of the sorew or bolt within said piece being provided with means coacting with said perforated member and the reinforcing to prevent outward movement of the sorew or bolt with respect to said piece, substantially as described.
- 4. The combination of a piece of reinforced concrete, a pair of washers embedded in said piece, one on either side of the reinforcing, and a sorew or bolt extending through said washers and the reinforcing and having one portion disposed within said piece and the other end portion extending outwardly from said piece, the end of the sorew or bolt within said piece being provided with means coacting with said washers and the reinforcing to prevent outward movement of the sorew or bolt with respect to said piece, substantially as described.

REMARKS

It is thought that the objection to claim 1, former claim 11, made in the last Office action is unwarrented. It does not seem necessary to include in this claim the member (shown in the drawing as angle iron 19) which coacts with the screw or bolt to provide an attachment or connection with an adjecent piece, as this member,

before the assembling of the pieces, is not necessarily secured to either of them, as will be evident from a perusal of lines 20 to 29, page 4 of the specification. The Examiner is accordingly requested to waive the objection to this claim.

Hew claims 2 to 4, which are drawn along the lines of present claim 1, are believed to be clearly allowable and are thought necessary to adequately protect applicent in his invention.

An allowance of this application is requested.

Reepentfully submitted, THOMAS A. EDISON

By Frank L. Dyer.

His Attorney

Orange, New Jersey September 2, 1914

WAH-JS

Div. 33 Room 70

Address only
"The Commissioner of Patente,
Washington, D. C.,"
and not any official by name.

2-260

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON

Oct. 14, 1914.

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i e	30 mag 1 h		
Frank L. Dyer,	. • •		
Oranga, N.J.		-	
Please find below a communication from the EXAL	WHER in charge of the	application of	
Thomas A. Edison: Ser. Ho. 639,			
1			••••
Concrete Furniture.			••••
	H_	Similar	
-dust	Thomas	ssioner of Patents.	

Responsive to amendment of Sept. 3, 1914.

In addition to the reforences of record, present chaim 1, former 11, is rejected on

Kelly, 358,203, Feb. 22, 1887, 72-120.

New claims 2, 3 and 4 are rejected on the same reference.

Examiner, Div. 33.

2.

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Patent Series Patent Application Files

Folio # 767 Phonographs

Serial #: 639716

Primary Applicant: Moore, Sherwood T

Date Executed: 7/19/1911

Title Phenographs Filed July 21 1911: Examiner's Room No. Assignce J. N. Ladiene, Jue. Assign text Exec July 191911. Recorded July 211911 Liber Q. 27 Page 196 Patent No. Issued ACTIONS. 1 Office hatter dept. 9 1911. 16 2 Amuseld Bug. 21912. 17 3 Rejected Left 37-112 18 4 10 5 20 6 21 7 29 8 23 0 34 11 26 12 27 13 28 14 20 16 50 FRANK L. DVER. Commel.	Applicant.	Address.
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FRANK L. DYER,	14	20
	15	FRANK L. DYER,

(Ost 16)

Petition.

To the Commissioner of Patents:

Our Petitioner SHERWOOD T. MOORS, a citizen of the United States, residing and having a Post Office address at \$2.49 High Street, West Orange, in the County of Heaves and State of New yeresy,

prays that letters patent may be granted to him for the improvements in

PHOHOGRAPHS

set forth in the annexed specification; and he hereby appoints Frank L. Ayer (Registration Lo. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Cherwood J. moore

-SPECIFICATION -

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, SHEWWOOD T. MOORE, a citizen of the United States and a resident of West Orange, in the County of Essex and State of New Jersey, have made a certain new and useful invention in PHONOGRAPHS, of which the following is a description:

My invention relates to phonographs and more particularly to an improved stylus mounting therefor.

In order to obtain a large volume, it is desirable to employ a heavy reproducer or floating weight and a record material of considerable hardness. Such a record material wears away the usual sapphire stylus to a considerable extent so that it is extremely desirable to employ a stylus made of an extremely hard raterial such as diamond; but, while diamond has been suggested for this use there have been difficulties attending the mounting of the same in an economical and efficient manner. The principal object of my invention is to provide an improved mounting whereby the ordinary diamond splints which may be obtained in the market may be cheaply and firmly secured in place in their supports. Other objects of my invention will appear more fully in the following specification and appended claims:

In order that my invention may be were fully understood, attention is hereby directed to the accompanying drawing forming a part of this specification and in which - Fig. 1 represents the side elevation of a reproducer provided with a ctylus lever having a stylus mounted therein according to my invention;

Fig. 2 represents a side elevation of a block of material from which the etylue lever is to be formed, a stylue being mounted in place therein and the outline of the lever being indicated in dotted lines;

Fig. 3 represents a botton plan view of the same, the outline of the stylus lever being likewise shown in dotted lines;

Fig. 4 represents a wertical cross-sectional view of the stylus mounting taken by a plane extending through the centre of the opening in which the etylus is essured; and

Fig. 5 represents a central vertical sectional view taken at right angles to that shown in Figure 4.

In all of the views, like parte are designated by the same reference muserals.

Referring to the drawinge, my improved stylue is formed from a diamond eplint indicated at 1. Splints such as that illustrated in suitable size may be obtained in the market and are of various shapes being more or less irregular and rough in appearance. In the formation of the stylus from such a splint, I prepare only one end of the splint since the roughness and irregularity of the body thereof are of advantage in securing the splint in place. Having obtained the splint, I form the same with a tapered end 2 having a rounded point 3 adapted to travel in the groove of a sound record. The tapered end of the stylus may be formed in any entitable way, as for example,

by the method set forth in the application of Thomas Λ . Edison, Serial No. 551,128, filed on March 23, 1910.

After the splint 1 has been formed as described above, an opening 4 is formed in a block 5 of the material from which the stylus lever is to be formed, this opening being preferably of such a size that the stylus when inserted therein engages the upper and side walls thereof so that it will not readily work loose in use. A slot or kerf 6 is then formed in said block so as to intersect the opening 4. This slot is preferably made of considerable length and depth so as to form a channel extending about the stylus from one side to the opposite side thereof. As shown in the drawings, an open slot is formed in a quasi-segmental form in the forward lower end of the lever. The stylus having been mounted in the opening 4 so as to rest in engagement with the upper and side walls thereof, solder or braze is applied to the slot or kerf 6 and the opening 4 so as to braze the stylus in place. Any suitable solder or braze may be used for this purpose. By means of the slot 6, this solder is permitted to flow freely about the stylus into the opening 4 so that the stylus is securely held or anchored in place. I next cut away the superfluous material of the block on the dotted lines indicated in Figures 2 and 3 to form the stylus lever into the proper shape. Obviously, however, the stylus lever might be formed of the desired shape before the stylus is mounted therein.

In Figure 1, I have shown my improved stylus mounting applied to a reproducer of a type described and claimed in the application of Themas A. Edison, Serial No.

627,592 filed on May 18, 1911. In this figure, 7 represents the stylus lever which is pivotally mounted on a floating weight 8 supported from the disphragm casing 9 as by a spring 10. The numeral 11 represents the connection between the stylus lever and disphragm. My invention may obviously be applied to any other type of reproducer than that shown.

While I have shown a preferred embediment of my invention, muserous modifications fall within the scope of the same. I wish, therefore, not to be limited to the exact details shown and described, but what I claim and desire to protect by Letters Patent is as follows:

- As a new article of manufacture, a stylus lever having a stylus brazed therein, substantially as described.
- 2. In a device of the claus described, a stylus support having an opening therein and a stylus soldered in said opening, the said support having also a recess intersecting said opening to onsure a proper distribution of the solder about said stylus, substantially as described.
- 3. In a device of the class described, a stylus support having an opening therein and a diamond stylus having an irregular unfinished portion brazed in said opening, the said support having also a slot or kerf intersecting said opening and extending to the exterior of said support to ensure a proper distribution of the braze or solder about said stylus, substantially as described.
- In a device of the class described, a stylus support, having an opening therein and a diamond stylus

having an irregular unfinished portion brazed in said opening and engaging the walls thereof, the eath support having also a slot or kerf intersecting said opening and extending to the exterior of eath support to ensure a proper distribution of the braze or solder about said etylus, substantially as desorbed.

d. The method of nounting a ctylus in the cupport which consists in forming in the support an opening to receive the stylus and a slot intersecting said opening, placing the stylus in the opening in the support, and applying colder to said opening and slot to secure the stylus in position, substantially as described.

- 6. The sethod of mounting a styles in its support which coneists in forming in the support an opening of a size adapting the body of the stylus to approximately fit the same and also a clot intersecting said opening, placing the body of the stylus in the opening in the support, and applying solder to waid opening and slot to secure the stylus in position, sibetantially as described.
- 7. The method of mounting a stylue in ite support which consists in forming in the support an opening provided with an end wall, said opening being of a niss adapting the body of the etylue to approximately fit the same, forming a clot interecting said opening, placing the body of the stylue in the opening in the support in engagement with said end wall, and applying soder to said opening and slot to secure the stylue in position, substantially as described.

This specification signed and witnessed this 19 day of July 190/ Cherwood J. moore Mitnesses: 1. Tuderick Barkmann 2 Bruna P. Klehn

Oath.

State of New Jersey County of Essex

, the above named SHERWOOD T. MOORE petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of West Orange, Essex County, New Jersey

that he berily believes himself to be the original, first and sole inventor of the improbements in PHONOGRAPHS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the Quited States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Shurred I, more 1900 Shurred I make 1900 Motary Public.

[Seal]

Div.23Room379 .tddrau oxly "The Commissioner of Patents Washington, D. C."

2-260

WASHINGTON

DEPARTMENT OF THE INTERIOR J.H.Y.)s.

UNITED STATES PATENT OFFICE

Sept. 9, 1911.

Shorwood T. Moore, c/o Frank L. Dyer, Orange, N. J. . P 1721 W. Fig.

Please find below a communication from the EXAMINER in charge of your application. for Phonographs, filed July 21, 1911, sorial number 639,716.

1903 20,768, (181940).

Claims 1 to 4 inclusive are drawn to a article while claims 3 to 7 ax inclusive are drawn to a method. Inasmuch as the article could be produced by other methods than that claimed the article and the method are held to ma be separate inventions and division is required according to the provisions of rule 42.

In amending this case applicant should con ult.

Edison Aug. 7, 1900, : 655,480 (181-10)

Edison June 17, 1890 430,278 (181-10)

Macdonald Oct. 21, 1902 711,706 (181-2)

Englash petent to Junghecker et al, may 31, 1902 12,456, (J81-11) English patent to Oakford, Sept. 26, IN THE UNITED STATES PATEUT OFFICE

Shorwood T. Moore)	
PHONOGRAPHS)	Room No. 379
Filed July 21, 1911)	Room No. 279
Serial No. 659.716	.)	

HOMORABLE COMMISSIONER OF PATERTS,

SIR:

In response to the Office action of September 9, 1911, please amond the above entitled case as follows:-

Cancel claims 5 to 7 inclusive.

REHARKS

The Examiner's requirement for division has been complied with, and action on the morits of the claims now in the case is respectfully requested. The right is reserved to file a divisional application on the subject matter of the canceled claims.

Respectfully submitted,

SHERWOOD T. MOORE

By Frank L. Ayer.
His Attornoy

Orange, New Jersey
August 2 , 1912.

Div.23. Room279

Address only
"The Convenience of Patents,
Washington, D. C."

J. H. D. -Sut.

0.5-1631

2-260

Pupor No. R. R. S. All communications respecting this itselfon should give the serial number,

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON Sept. 27,1912.

Sharwood T. Mocre, Care Frank L. Dyer, Orange, New Jarsey .

U.S. PATENT OFFICE, SEP 271912 MAILED.

Please find below a communication from the EXAMINER in charge of your application.

for Phonographs, filed July 21, 1911, serial number 639,716 .

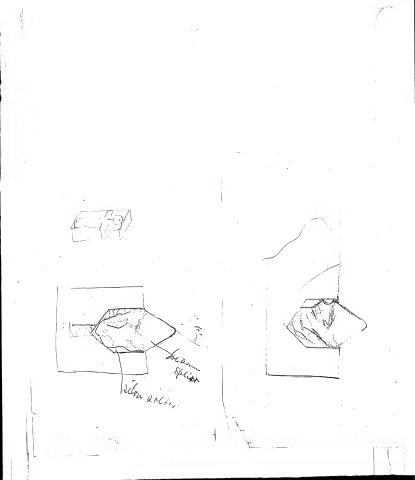
& BMsore!

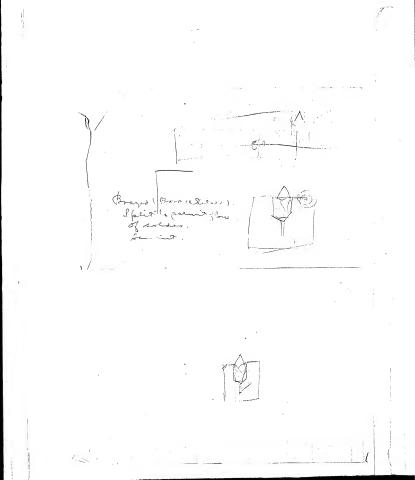
Claim 1 is rejected upon Jetter, July 30,1912, #1,034,387, (181-11), also upon either Edison of record or Head, May 18,1006, #820,926, (181-11), or Levin, qept. 19,1911, #1,005,-474, (181-11), Soldering is held to be the patentable equivalent of cementing.

Claim 2 is rejected upon Jetter, Levin or Head for the reasons given.

Claims 3 and 4 are rejected upon the references and reasons given in view of any diamond stylus as in Jungbooker of record. No invention is found in previding rough surface on the diamond as such is a common expedient in cementing and soldering when a strong connection is desired.

See Moors & patent the new way of eithing the draword u the new resperducer 6 y Parcymy in split halder





Patent Series Patent Application Files

Folio # 770 Electroplating Apparatus

U.S. Patent #: 1016875

Primary Applicant: Edison, Thomas A

Date Executed: 7/24/1911

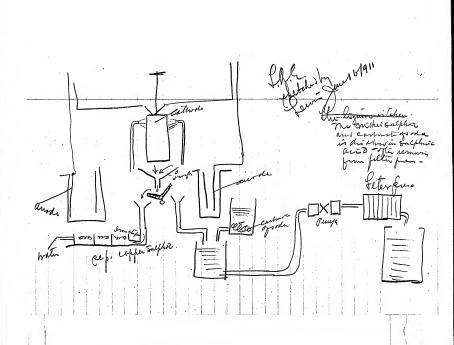
The object of this invention. to sayse the wital, lost in the walers of my process of making wickel Cake for Dlorage Gallee. described in my Inland after the drawn upon which a planning of makel is departed it is will trawn from the lank which washes off the felm of the planning o oruhow Colich deings to the drum This polation is composed of Sulphate of nickel + I lost in the wash waters, The same thing occurs deschan the

layer of Copper is plated owde the welled in the Coise. the Electroly les one place of Copper with some sulphung aled These last with locale water-Josave these wetals to ave them acranged at the wash rough so that when the doubt Comes from Che wickel bath the weest water powers to a tank & cohen the drum Comes from the Cappen bath the gate is change to throw the work coller uto another Tank Thus

Keeping the two colition The oregoneration as average of Tucase of the Copper Colution it passes Through several troughs filled will Iron Turning from the factore these decompose the solution deporteme métallie copper ma The daw reduce combines with the non to farm ferrous suppliede colich remain a solution the fund coalers santo the sever free of Copper

In the case of the nickel This passed to a small Tank into colinela predelominal stream af a solution of Either Carbonale or Course soda pouse precipitaling the makel as Insolvable Contonale or Hopdroxide in a willy form The Delphone ared combin with Chevolaremans disolved The colors afthe continuely to an ordinary filler press + the salt oblamed ich Cakes which can then be made unto fresh sulphale cof makel with Eulphuric

Electrolyle of the plaling Recent from T. A. Edison, May 22, 191



Patent Series

Patent Application Files

Folio # 772 Storage Battery Motor Sets

Serial #: 642072

Primary Applicant: Edison, Thomas A

Date Executed: 8/1/1911

chigh to Elian Sto Bords Serial No.642, 072 Folio No. 772 Address. Applicant. Thomas . 8 Edwar Ballery motor Sets Examiner's Room No. 105 Filed . Jug. 3 1911. Assignee Ass'g't Exec. Recorded Liber Patent No. Wandered Issued ACTIONS. 1 Rejected nov 11,911 16 mended Nov. 8-1912 17 3 Resected Jan. 6 - 1913 18 mended Jan. 3-1914. 10 1 Resected Jeb 10 - 214 20 6 amended Irl. 3-1915 21. Tinal resection Warch 3-1915 22. amended 71ch. 18,1916 23 w dIPI, Plant or taxing laint associate & man of ally to 11 Dyer 70 Holden -12

Dyen of Holden, Oliver

Orange, New Jersey

Petition.

To the Commissioner of Patents:

Your Petitioner THOMAS A. EDISOH a citizen of the United States, residing and having a Post Office address at

Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improbements in

STORAGE BATTERY-MOTOR SETS

set forth in the annexed specification; and he hereby appoints Frank L. Oper (Registration No. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alteratious and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therebyth.

Thos. S. Edison_

SPECIFICATION

TO ALL WHOM IT MAY CONCERN: -

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, west Orange, Essac County, New Jersey, have invented certain new and useful improvements in SYGNAGE BATTERY-MOTOR SETS, of which the following is a specification:

My invention relates to storage battery-motor sets, and particularly to apparatus of this character intended for use upon vehicles for the propulsion of the same. The object of my invention is to produce apparatus of this kind capable of being supplied at a much lower cost than heretofore, and more particularly to reduce the initial cost of electric delivery wegons so as to bring them within the means of small dealers who deliver articles from their stores to their outcomers.

The present practice in the monufacture of electrically driven vehicles, such as trucks and automobiles, is to use a relatively large number of cells and high voltage. For example, the voltages hitherto used in ordinary practice range from 40 to 50 volts for the small electric runabouts to as high as 75 to 80 volts for the large motordriven trucks. In order to obtain such voltages, a comparatively large number of storage battery cells are required. Such an equipment is liable to troubles from grounds or leakage in the wiring, batteries or motors, on account of the relatively high voltages employed, and is unmocessarily expensive. I have found that by certain modifications of the motor construction, a storage battery of much lower voltage can be used efficiently for the above purpose, thus securing a relatively inexpensive equipment and all the advantages of a low voltage at the battery and motor.

My invention consists in the employment of a relatively small number of storage battery ocils capable of discharging at a very high rate without injury to the battery, and in a radical departure from the ordinary design of motors, in order to adapt them to the high discharge rate batteries and to enable them to be efficiently operated by a relatively small number of cells, particularly where the vehicles are to be used on roads having excessive grades and necessitating greatly increased power at times. ordinary practice, the battery employed is more expensive than the motor, and it is consequently very desirable to diminish the number of cells of the battery to a minimum, and this may be done by modifying the design of the motor in such a way that although its cost is increased, the added cost will be but a fraction of the cost of the battery such as is ordinarily employed with a motor designed according to ordinary practice. Inasmuch as a relatively low voltage battery is to be used, the motor must be designed to carry safely a very large current and to stand a considerable overload for long periods of time. motor in my improved storage battery-motor set is constructed of abnormally low internal resistance, and all of the ourrent-carrying conductors are abnormally large in cross

The motor armature and commutator have an absection. normal design as related to each other. Instead of the length of the commutator being less than the length of the armature, as ie ouetomary in ordinary practice, the commutator is made equal to or greater than, and preferably substantially twice as long as the armature. The brush area for taking off the current is two or more times greater than in ordinary design, so that the loss in voltage when ascending eteep gradee is not greater than the loss in voltage on the level in the case of a motor of ordinary design. The amount of copper used to energize the field is made double or nearly so that employed in motors as By employment of my invention, I ordinarily designed. have constructed a twenty-volt motor suitable for propelling a 1500 lb. delivery wagon, and the extra expense of the lengthened commutator and extra copper in the windings is more than overcome by saving of a number of celle of etorage battery costing three or more times as much. My improved motor is so designed that the heating is enermously diminished, sparking is eliminated, and the whole combination of battery and motor is of the most effective and reliable character. The alkaline or Edison type of storage battery is particularly adapted for use in a storage battery-motor eet of this character, because this type of battery is capable of discharging at an enormously high rate without injury to the battery. For example, batteries of this type stand repeated discharges at 240 amperes, or 300 percent more than normal. known, discharge rates above normal are very injurious to batteries of the lead type. I prefer to make use of a

2 -

battery of cells of the Edicon type in which the thickness of the pockets and the diameter of the tubes have been reduced so as to permit an increased number of plates to coupy a given space and thereby afford an increased area of active surface per unit of volume or weight.

I have illustrated one embodiment of my invention in the drawings which accompany and form a part of this epocification, and in which -

Figure 1 is a plan view of the running gear of a vehicle equipped with my improved storage battery-motor set; and

Figure 2 is a view partly in longitudinal section through the motor.

Throughout the several views of the drawing, like reference characters are employed to designate like parts.

Referring to the drewings, a set of storage batteries 1 connected in series by suitable connectors 2 is shown. The motor is shown at 3 and is connected in series with the battery by conductors 4 and 5. A controller 5 of ordinary construction is provided in one of the conductors, as for example, 5. The outline of the body of the vehicle is shown at 7, and the storage battery may be carried in the said body. The wheele of the vehicle are shown at 8, 9, 10 and 11. The motor 2 is mounted in any suitable manner upon the running gear 12. The motor 2 is provided with a sprooket wheel 14 secured to its shaft. A countershaft 15 is revolubly mounted in bearings 15 on the running gear. The counterchaft 15 is provided with approach theels 16, 17 and 18 secured thereto. The sproof

ket wheel 17 is situated in line with the sprocket wheel 14 of the motor and the chain arive 19 is provided for driving the eprocket wheel 17 from the approach wheel 14. The weblic wheel 9 has secured to it and concentrically therewith a sprocket wheel 22 and the vehicle wheel 10 has secured to it and concentrically therewith a sprocket wheel 21 connects the approach wheel 22 and 18 and the chain drive 21 connects the approach wheels 22 and 18 and the chain drive 20 connects the eprocket wheels 23 and 16. Any other suitable form of mechanium may be utilized for driving the vehicle wheels 9 and 10 from the motor 3.

The motor comprises a casing 30 provided with bearings 31 and 32 in which the shaft 33 is journaled. Pole pieces 34, preferably of laminated iron, are mounted in the casing in any suitable manner, and these pole pieces are provided with field windings 35 preferably of heavy copper strip. The motor illustrated is a two-pole motor. The armature core 36 preferably of laminated iron is mounted upon shaft 33 and carries the armature windings 37. The armature winding has preferably not more than one turn of wire per coil. The commutator segmente 38 are mounted upon the shaft 33 and are suitably connected to the armature windings 37. Bruehee 39, preferably of carbon, are provided and are supported in brush holders 40. The brush holders 40 are provided with binding posts 41 or other emitable means for connecting the motor to the conduotors 4 and 5. The motor is preferably series connected. The abnormal length of commutator as compared with the longth of armature is evident from an inspection of Figure 2, and it will also be noted that a relatively large brueh area

is provided. Insumuch as there is only one turn per coil of the strature, the voltage between the segments of the armature is reduced to a very small amount in a 20-volt winding, and therefore, there is no tendency whatever to sport or finah under heavy loads.

Actual service conditions show that an electric vehicle having a normally low current of say 75 ampores when running on the level, may require from 200 to 250 amperes when climbing, or on had roads. A motor of ordinary design with a relatively small commutator and light winding in the armature and field is very liable to break down or burn out. A motor constructed in accordance with my invention will withstand these extreme conditions of overloading without any difficulty whatever, owing to the low voltage and large cross section of conductors used. My improved motor may be exposed to water and extreme weather conditions without any damage whatever, and furthermore, a motor of this character is well adapted for continuous use in unskilled hands. Owing to the low voltage used in my improved system, it is not necessary that the motor be made completely water tight. It may be left relatively open so that sotive and free ventilation on all parts of the winding and the motor is permitted. This is a valuable feature when the motor is subjected to heavy and continuous overloading, for in such a case a completely enclosed motor is liable to damage from overheating, while an open motor is not injured.

In apparatus embodying my invention which I have had constructed and tested, a delivery wagon was

squipped with a bettery of 16 A-8 Edison cells, the voltage of which varied from about 18 volts to 12 during the tests, the total weight of the cutfit was about 2310 pounds, and the internal resistance of the motor was about .086 chms.

Having now described my invention, what I claim and desire to protect by Lotters Patent of the United States is as follows:-

- 1. In a storage battery-motor set, the combination with an electric meter having an abnormally extended area of brush contact at the commutator, and a storage battery electrically connected to said motor and capable of enormously high discharge rates, substantially as and for the purposes set forth.
- 2. In a storage battery-motor set, the combination of an electric motor of abnormally lew internal recistance and with an abnormally extended area of brush content at the commutator, and a storage battery electrically connected therewith and capable of an enormously high discharge rate, substantially as and for the purposes set forth.
- 3. In a storage battery-maker set, the combination of an electric motor, having an abmymally actended area of brush contact with the commutator, and a storage battery of the Edward horsewith, substantially as and for the purposes set forth.
- 4. An electric motor for use with storage bettery med cateful for electric and Throtal file and a commutator connected to the armsture and field, and a commutator connected to the armsture and of a length substantially the same or greater than the armsture, as and for the purposes set forth.

S. An electric motor for use with storage battery sets comprising a field, the windings of which are insulated copper strips of abnormally low resistance, and an armature mounted to rotate with respect to the field, and a commutator connected by the armature of a longth substantially equal to or greater than the areature, as and for the purposes set forth.

6. In a storage battery-motor set, the combination of am electric meter having field and armature windings of abnormally large cross section, and a storage battery electrically commended therewith and capable of an enormously high discharge rate, substantially as and for the purposes set forth.

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This specification signed and witnessed this 1st day of Fuguet 1988					
V					
Thos. & Edison					
Witnesses:					
1. Tenny Lauchan					
2. Anna P. Klehm					
Oath.					
State of New Tersey as.,					
County of Essex					
THOMAS A. RUISON , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United					
States, and a resident of Llewellyn Park, West Orange, Essex County,					
New Jersey					

that he verily believes himself to be the original, first and sole inventor of the involvements in

STORAGE BATTERY-MOTOR SETS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or obscovery thereof; or patented or described in any printed publication in the Chitico Satates of America or any foreign country before his inheution or discovery thereof, or more than two pears prior to this application; or patented in any country foreign to the Chitico Satates on an application filed more than twelve months prior to this application; or in public use or on sale in the United Satates for more than two pears prior to this application; and that no application for patent upon sale invention has been filed by him or his legal representatives or assigns in any foreign country.

ntatives or	assigns in any torei		
	•	Th	s. A. Edison
∌worn to	and subscribed befor		day of August 1901
		NOTARY PL	JELIC
			Notary Public.

From 1

Seal

642,072) 772 / Sn. of Sheet. / $D_{i_{\mathcal{V}}}$ Fig. To Inventor: his Hilly

VCC

Paper No

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

November 11, 1911.

Thomas A. Edison,

o/o Frank L. Dyer.

Orange, New Jersey.

Pleuse find below a communication from the EXAMINER in charge of your application. for Storage Battery-Motor Sete, filed Aug. 3, 1911, Scrial No. 642,072.

Claims 1, 2 and 6 are rejected as manifest aggregations of a motor and a storage battery. If a storage battery is only capable of furnishing one and a half volts there would furthermore be no invention required to select a translating dovice adapted to run in connection therewith; it would be the only obvious thing to do. Aside from the merits involved these claims are essentially vague and indefinite. - "abnormally extended area" (claim 1) and "abnormally low internal resistance" (claim 2) do not mean anything structurally, and in claim 3 "battery of the Edison type", besides the same objection of indefiniteness, presents the further objection that the Office does not understand what type is meant, and, moreover, whatever is now meant it would probably be subject to change and variation as the art advances.

Claims 3, 4 and 5 are rejected as for well-known relations exieting in a certain class of dynamos between the design of the commutator and that of the armature. Note, for instance, Parsons, 344,542, June 29, 1886, Bipolar, and diagram 4 of "Die Gleichstrommaschine" by Arnold, Berlin, 1907, Julius Springer, the description of which on page 184 sets forth that the ueeful length of the commutator is 39 cm, whereas the useful length of the winding is given as 26-mm. These three claims are rejected on either of the references given, and as furthermore presenting only matter that would be obvious to any machine designer.

IN THE UNITED STATES PATENT OFFICE

Thomae A. Edicon STORAGE BATTERY MOTOR SETS Filed August 3, 1911 Seriel No. 642,07%

Room No. 105.

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of Hovember 11, 1911, please amend the above entitled case as follows:-

Claim 3, line 2, after "motor" insert - of abnormally low internal recietance and - . Line 3, change "a" to - an alkaline - . Line 4, cancel "of the Edison type".

Claim 4, line 2, after "eete" insert - and adapted for operation at moderate epeads - .

Claim 5, line 2, after "sete" ineert - and adapted for operation at moderate epeede, - .

-banaled 1/3/14

Add the following claim: -

7. In apparatue of the class described, the combination of a driven member required to trumsmit torque varying through wide limits, on electric motor) operatively connected to said member for driving the same, a storage battery, for supplying current to the motor and capable of discharging at a rate greatly in excess of normal, said excessive discharge rate being necessary and sufficient to operate the motor to cause the driven member to transmit its maximum

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torque and said motor heving a sufficiently low internal resistance and sufficiently large dommutator and brush contact area) to enable the motor to operate when carrying said excessive discharge without excessive loss in voltage in the motor, substantially as described.

REMARKS

The Office action of Hovember 11, 1911 has been carefully considered. Applicant's invortion involves a marked departure from standard practice in storage battery motor sets used in the propulsion of vehicles and for similar purposes, and his improved meter involves features differing in a marked degree from standard design. It is thought that these features are properly expressed by the expressions "abnormally extended area" and "abnormally low internal recistence" contained in certain of the claims, the word "abnormally" meaning a marked departure from standard practice. The Examinor is therefore requested to withdraw his objection to these terms.

Claim 3 has been amended to overcome the Examiner's objection to defining the battery as a "battery of the Edi-sen type". The patent to Parsons, No. 344,542, shows apparatus very different from applicant's opparatus and intended for a very different purpose. This patent shows a generator intended to be operated at an excessively high speed, that is to say, at a speed of from 10,000 to 25,000 revolutions per minute. Applicant's motor is intended to be operated at ordinary motor speeds, one of the machines embodying the invention having been constructed to operate at a speed of 1700 revolutions per minute. The distinction

that the motor is adapted to operate at moderate speeds has been introduced into claims 4 and 5. The Examiner also refers to "Die Gleichstrommaschine" by Arnold, and applicant has had his representative look up this reference in the Patent Office and has been informed that the citation is incorrectly given in the Office letter. The diagram intended to be cited is understood to show a turbo generator, and the argument made in connection with the patent to Parsons is believed to be applicable to the structure shown in Arnold. Applicant appears to be the first to use a storage battery capable of onormously high discharge rutes combined with an electric motor of abnormally low internal registance and abnormally extended area of brush contact with the commutator, and by this combination he has attained certain useful results which are set forth fully in the specification.

In now claim 7 added by the above amendment, an attempt is made to set forth the relation between the maximum torque transmitted by the driven member and the excessive discharge rate of the storage battery. Applicant's invention has been thoroughly tested in a practical mammer and is believed to have great morts.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON
By Frank L. Slyer

His Attorney

Orango, New Jersoy November 8th, 1912.

voo

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON

January 6, 1913.

Thomas A. Edison.

642,072.

c/c Frank L. Dyer,

4 AM 75 (318) -

Orange, H. J.

Please find below a communication from the EXAMINER in charge of your application. for Storage Battery-Hotor Sets, filed Aug. 3, 1911, Serial No.

EBMsore!

In response to amendment of Nov. 9, 1912.

The objection urgod against the expressions "abnormally extended area" and "abnormally low internal resistance" seems to be proper and is therefore reposted. Further, the expressions employed in the new claim 7 "at a rate greatly in excess of normal" and "sufficiently low internal resistance and sufficiently large commutator and brush contact area, etc." are equally vague, indefinite and objectionable.

It is also true that standard practice with regard to area of commutator and brush contact surface is to proportion the area to the ourrent, and it does not appear that the applicant has in any manner whatecever departed from such standard practice. See, for example, the General Electric Company's Bulletin No. 4,350, Pub. April, 1904, by the Power and Mining Department, especially the illustration on page 4 and the list of plating dynamos at the top of page 8.

Claims 1, 2, 6 and 7 are rejected as obvious aggregations of motor and storage battery. See the first paragraph of the last Office letter. Claim 7 in fact covers merely a driven member on which the load varies widely and a storage battery and motor adapted to work together and to do the work necessary. No one

can monopolize such a combination and, in fact, to employ a storage battery and a motor which were not adapted to work together and would not do the work would be contrary to the dictates of reason.

The above claims cover an alleged combination clearly divisible from the generator claims numbered 3, 4 and 5 and division is therefore required between the two groups.

Claims 3, 4 and 5 are rejected upon the references of record and upon the General Electric Bulletin, above.

No further action on the merits will be given until the requirement for division has been complied with.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison STORAGE BATTERY MOTOR SETS

Room No. 105.

Filed August 3, 1911 Serial No. 642,072

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of January 6, 1913, please amend the above entitled case as follows:-

Page 3, line 22, after "alkaline" insert - nickel-iron - .

Rewrite the claims as follows: -

- 1. In apparatus at the liese describes, the odministion of a driven member required to transmit torque varying through wide limits, a series electric motor operatively commoted to said member for driving the same, and a storage battery for supplying ourrent to the motor capable of discharging at a rate in excess of normal, necessary and sufficient to operate the motor to cause the driven member to transmit the maximum torque required, end said motor having low internal resistance in both field and armature windings and having brush and commutator contact area at least true as great as required by the rules of ordinary design, substantially he described.
- 2. In apparatus of the class described, the combination of a driven member required to transmit torque vary-

ing through wide limits, a series electric motor operatively connected to said member for driving the same, and a storage battery for supplying ourrent to the motor capable of discharging at a rate in excess of normal, necessary and sufficient to operate the motor to cause the driven member to transmit the maximum torque required, (and said motor having low internal resistance and having brush end commutator contect area sufficiently great to substantially climinate sparking even when the motor is supplied with ourrent at the aforesaid excessive rate, substantially as described.

RRHARKS

The claims have been rewritten with a view to setting forth applicant's invention more ascuratoly and to avoid the Examiner's objections. It is believed that these claims cannot be considered as aggregations insemuch as the classate recited in each of these coast to produce a unitary result. In this connection the Examiner's attention is called to a recent decision of the Circuit Court of Appeals for the Seventh Circuit, Erell Auto Grand Piano Co. of Amorica vs. Story & Clark Co. et al., 207 f. R., 946, see particularly 951, in which the Court makes the following statement:

"In mother sense (which, in the interest of accurate terminology, might well be taken as the exclusive sense) 'sggregation' means that the claims, in end of themselves, independently of the prior art, show that the elements are incapable of coacting to produce a unitary result."

The General Electric Company's Bulletin cited shows merely a solf-excited (presumably shunt) or separately

excited generator designed to generate currents of largs amperage at low voltages, and while a long commutator is used, this commutator appears to be designed in accordance with the rules of ordinary design to take care of the large amount of ourrent carried by it. Similarly, in the patent to Parsons cited, the high speed generator shown is provided with a long commutator, but there is no suggestion that the bruch contact area is made abnormally great, as is the case in applicant's invention. In applicant's improved motor, the brush contact area is made two or more times greater than the ordinary design - eee specification, page 3. In other words, applicant hasnot merely increased the brush contact area sufficiently to carry the current used, but has increased it in a much greater proportion. The commutator brush area in applicant's improved apparatus is far in excess of that heretofore considered necessary and generally adopted to carry the current used. By using such an abnormal contact area relative to the voltage and current, applicant is enabled to reduce the resistance at the commutator to the smallest possible amount and at the same time, if decired, the pressure of each carbon brush upon the commutator may be diminished as compared with the pressure ordinarily used, so that the resistance of the bridge of carbon across the commutator bars may be made very high, thus tending to reduce the armaturs waste in momentarily short-circuited coils. The suployment of the excessive brush contact area substantially eliminates sparking, even on heavy loads, and renders unnecessary the use of commutating poles or other devices to reduce sparking or to save the commutator from outting and wearing.

Applicant's invention involves a marked departure from previous practice, has proved to be of great utility, and is believed to be deserving of patent protection.

Reconsideration and allowance are requested.

Respectfully submitted.

THOMAS A. EDISON
By Frank L. Clyp

His Attorney

Orange, New Jersey January 3rd, 1914

Ch.S

Div. 26 Room 105

Address only
"The Commissioner of Peteris,
Weshington, D. C.,"

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JSR

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

	WASHINGTON	February 10, 1914.
Fr	ank L. Dver,	S. PATENT OFFICE
	Orange,	(FEB 101914)
:	How Joreey.	MAILED.
1	Please find below a communication from the EXAMINER in	charge of the application of
.Th	omas A. Edison, Serial No. 642,072, filed	Aug. 3, 1911, for

In response to amendment of Jan. 5, 1914.

The new claims are rejected as unpatentable combinations of motor and storage battery. The ground of this rejection is that it involves merely the skill to be expected of the electrician to use battery and motor which are adapted to work together in the old combination.

As to the proportions which the claims specify in the motor design, it is held that if there be departure from "the rules of Ordinary design", such departure is one in degree and not in kind,

It is, however, old, as shown by the references of record, to employ a commutator whose length is greater than that of the armature core; thus the applicant has not departed from ordinary practice in this respect. As to the brush contact area, he alleges apparture, but does not state either what the ordinary practice allows in emperes per cm² nor what he himself employs.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

STORAGE BATTERY MOTOR SETS

Room No. 105.

Filed August 3, 1911 Serial No. 642.072

HONORABLE COMMISSIONER OF PATENTS.

SIR:

In response to the Office action of February 10, 1914, please amond the above entitled case as follows:-

Claim 1, line 8, cencel "end".

Claim 2, line 8, cancel "and".

REHARKS

The Examiner states that the ground of rejection of the claims is that it involves merely the skill to bo expected of an electrician to use a battery and motor which are adapted to work together in an old combination. plicant has not morely used a battery and motor adapted to work togother, but in the combinations claimed there is a motor especially adapted for use with a battory having oertain characteristics set forth in the claims, the design of the motor being abnormal as compared with ordinary praction, and the ontire combination being capable of accomplishing a certain desired result with an officioney and economy constituting a marked advance in the art. Oertain advantagos of applicant's improved battery-motor set have been pointed out in the specification and in prior arguments, and especial attention is directed to the following points:-Decreased Liability to loakages and grounds because of possibility of using low voltages; diminution of heating;

substantial elimination of sparking; light brush load; reduction of woar of brushes, due to the decreased brush prossure permissible. Applicant's improved battery motor ast in well adapted for continuous use in unskilled hands.

It is well recognized by the courts that a change in proportion of parts may emount to invention if a new function or a particular new and useful result are accomplished thereby. In applicant's improved battery; motor sot, the motor is obnormal indesign as compared with ordinary practice in several respects, and by the use of such a motor with a suitable battery the particular new and useful results mentioned above are attained.

The Examinor states that it is old to employ a commutator whose length is Breater than that of the armature core. An inspection of the claims will show that applicant is not relying for the petentability of his invention upon the use of a long commutator. In one of applicant's improved battery meter sets, applicant used for the meter brushes a special kind of high conductive metal carbon rated by the menufacturer to carry normally 100 amperes per square inch. In the said meter as designed that the current density was only about 46 amperes per square inch at meximum load. The Examiner is requested to again consider carefully the argument accompanying the menufacent of Jenuary 3, 1914.

Respectfully submitted,

THOMAS A. EDISON
By Frank L. Lly

Orange, New Jersey February 3 , 1915 HL-JS His Attorne

Div. ...26... Room ...1.05
Attenuenty
"The Commissioner of Petants,

JSH 2-260

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

___Barch_3_1915.____

	S. PATENT OFFICE
Frank L. Byer.	MAR 8 1915
Orange	Region 2.
New Jersey.	
Please find below a communication from the EXAMINER in cha	rgs of the application of
212-1 tor 5	Howage Battery-Motor Set

Thomas Ewing,

Ser. No. 642,072

e 6-6831

In response to amendment filed Feb. 4, 1915.

The results enumerated, and alleged to be now and useful, are no doubt useful, but are not new, and are attained by the obvious application of the skill to be expected of the electrical artisan. As before stated, it would be contrary to the dictrices of reason to use motor and battery which were not capable of taking care of the temporary overloads and indepted to work tempeter. Horeover, now that the applicant has stated what current density he uses, it is possible to site references showing that he has departed little if at all from common practice. Arrand in "Me Gloighstromassolutes" sited, Vol. 1, pp. 147 and following, gives data of a number of machines, of which only five of the first thirteen are designed for higher densities than 45 superes per square inch. Bec copedially machine #12, with density of 32.8, and also #7, #8, #9 and #13.

The claims are therefore rejected, and this action may be considered final for the surposes of appeal if applicant so desires.

Acting Examiner - Division 26. See Buyer at it 5.5 White Butte May to 220 CP3. 349 - 120, 228 F 30

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison STORAGE BATTERY MOTOR SETS Filed August 3, 1911 Sorial No. 642,072

Reom No. 105.

HOHORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of March 5, 1915, please amend the above entitled case as follows:-

Claim 1, line 1, change "of the class described" to - for the propulsion of an electric vehicle - . Last line, after "design" insert - for vehicle maters - .

Add the following claim: -

3. In a storage battery motor set for the propulsion of an electric vehicle, the combination of a driven
member adapted to transmit torque varying through wide limits, a series electric motor of low internal resistance
operatively commoded to said member for driving the same,
and a low voltage storage battery for supplying current to
the motor capable of discharging at a rate in excess of
normal, necessary and sufficient to operate the motor to
cause the driven member to transmit the maximum torque required, said motor having its commutator longth equal to or
greater than its ammature longth and having its field coils
of at least twice the current carrying capacity and its

brush and commutator contact area at least twice as great as is required by the rules of ordinary design for vehicle motors, substantially as described. -

REMARKS

The ground of rejection set forth in the Office letter of March 3. 1915 is not entirely clear, but it is apparently the Examiner's position that applicant's improved storage battery motor set lacks invention, inaemuch as he states that the results are attained by the obvious application of the skill to be expected of the electrical artisan. The Examiner does not, however, state what portion of the prior art the electrical artisan would make use of in obtaining these results. The Examiner also states that "it would be contrary to the dictates of reason to use motor and battery which were not capable of taking cars of the temporary overloads and adapted to work together". Applicant is not claiming merely motor and battery capable of taking care of the temporary overloads and adapted to work together, but is claiming a combination including a battery having certain defined characteristics and a motor having certain structural features adapting it especially for use with the battery for the purpose of driving a member transmitting torque varying through wide limits. The combination claimed by applicant is new and involves a marked departure from the practice usual at the time of filing this application in battery and motor design for electrically driven vehicles.

The Examiner calls particular attention to the data of certain machines described by Arnold in "Die Gleighstrommaschine". The data of these machines have been carefully considered. Hone of these machines is a motor for propolling a vehicle. The prior practice in the design of motors

for vehicle propuleion was to make the motor as compact as possible, to use a relatively large number of cells and high voltage, and to provide a relatively small commutator. and it is to the practice in designing such storage battery motor eete that applicant particularly refere in comparing his improvemente. It is to be noted that the etatemente in applicant's communication dated February 3, 1915 regarding the particular example of a motor used by him in the embodiment of his invention does not form a part of the disclosure of the application but is merely given as an example. In this example, it is stated that the ourrent density is about 45 amperes per square inch at maximum load, and that the brushes used were of a special kind of high conductive metal carbon rated by the manufacturer to carry normally 100 amperes per square inch. The brush deneities which are calculated from the examples given in Arnold are for normal loade, not maximum loads, and there is nothing to show that anything but ordinary carbon brushes wore used, and presumably at that time ordinary carbon brushes were used. As the Examiner is no doubt aware, various improvements have been made in so-called metal carbon or graphite brushes which have vastly increased the carrying capacity of these bruehes. The comparison, therefore, of applicant's ourrent density with the densities employed in the machines described in Arnold is not a fair one, inasmuch as there is nothing to show that brushes of the same conductivity were employed in the two instances, and furthermore, as stated

above, these machines described in Arnold are not vehicle motore. It is, of course, well known that in the manufacture of small motors, brushes of a size greater than the ordinary practice are some times used for reasons of commercial expediency. This is probably the case in the motor described on page 147 of Arnold (Eschine Re. 1). This machine, however, is used to drive a contrifusal pump and therefore has a substantially constant load. In motors used for vehicle propulsion, the load verice enormously. For example, in the machine mentioned on page 6 of the especification of this application, a current descript of 75 ampores is employed when running on the level, and this current may rise from 200 to 250 amperce when climbing or on bad reads.

Olaim 1 has been amended to point out more definitely that the rules of ordinary design referred to as a standard of comparison are the rules of design for vehicle motors.

Claim 2 is believed to be patentable in its precent form for reasons heretofore set forth, and it is not seen that the Examiner is relying on any now ground of rejection in his letter of March 3, 1915.

Hew claim 3 submitted herewith includes the features of claim 1 and certain additional features, namely, the low voltage of the battery, the long commutator, and the large current capacity of the field coils.

The Examiner's real ground of rejection is apparently lack of invontion, and on this point it is believed that the decision of the Circuit Court of Appeals, Seventh Circuit, in Pieper et al. ve. S.S. White Dental Hfg. Co.. 228 F. R., 30, is of interest. In this decision the validity of the Pieper motor patent No. 704,099 is upheld, and in the combination claimed, the relation between certain electrical foatures of the windings, namely, the self induction of the armature coile and the self induction of the field windings. are of great importance, just as in the invention now under consideration the electrical features of the commutator and brush centact area. low internal resistance of motor in both field and armature windings, etc., are of importance. In this decision reference is made to Railroad Supply Co. vs. Hart Steel Co., 222 F. R., 261, and the following quotation from this decision is believed to be portinent to the invention under consideration:-

"Invotion of a cambination does not lie in gambering up the elements that are employed, but commists in first an entire that are employed, but in the commists in first an entire that a new and desirable consists in first an entire that in the commists of elements which no one has before perceived and then going forth to find the things that may be utilised in the new required relationship.

"In the new required relationship in the property of a new device is often the highest many in the part of a new device is often the highest many in the part of a new device is often to highest problem of invention and the first part of the patentse, and the part of the patentse, should regard the patentse's problem as of a time in the catter the application, and should therefore not to readily accept the expess facto wisdom of the part of the patentse of the patentse. It is not enough that patent in suit; it must see clearly the device of the patentse in suit; it must see clearly the device for the purpose of discovering in it the idea of the patents."

Certain advantages of applicant's invention have been set forth in the specification and prior arguments. Reconsideration and allowance are requested. Respectfully submitted,

THOMAS A. EDISON By Frank L. Llyan

His Attorney

Orange, New Jersey February /8 , 1916

HL-JS

DIV.26 Room105
Address only
"The Commissions of Patents,
Washington, D. C.,"

JSH 2-260 CJ

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON

WASHINGTON

WAR - 9, 1916.

Frank L. Dyer,

MAR 9 1910

Washing in charge of the application of

T. A. Mison, filed Aug. 3, 1911, for Storage Battery Notor Sets.

Ser. No. 642,072.

Commissions of Parish.

In response to amendment filed Feb. 19, 1916.

Upon reconsideration, the claims are again rejected for the reasons of record.

The applicant has taken a well known type of battery, expressly designed for use where sudden heavy overloads are fraquent, and particularly for driving motors on vehicles, and has exercised only the skill to be expected of the designer in building the motor to work with the battery. Large brush contact area and low internal resistance are, as shown by the publications of record, used for low voltage machines, and if the applicant has carries his design to an extreme in these respects, it differs only in degree, not in kind. Further, it is again noted that the description nowhere states what "ordinary practice" is, and it is therefore difficult to determine with certainty what will or will not fall within the scope of the invention.

Insemuch as claim 1, as amended, and claim 3 are directed to substantially the same subject matter as were the claims at the time of the last Office action, and bring up no new quastions, nor nocessitate the citation of new references, but are rejected on the same ground, this action is made final for the purpose of appeal.

Applicant's attention is directed to Commissioner's Order

Ser. No. 642,072...2.

No. 2210, 216 0. C. 1, in accordance with which no ameriment that does not place this case in condition for final action may be entered herein without the approval of a Law Examiner.

Examiner - Division 26.

than the mater it is story derivable The abject of this unention is to to demind the amount of reduce The initial cost of Electric Cattery to a minimum 4 delivery wagons to brug them this is Grought about by withen the meanin of shall adding to the cost actor dealers who deliver articles from matter (in such a way that their stores to their custome the will cost will be buil afraction of the Cost of a The invention courses in a Cally were a motor departures from the ordenwy used which is designed in design cap halons to adapt them to specincey designed his the ordinary way The Motor armature or communicalor to enable a fewer number of color the toads are very b have an abnomial designi as retated to Each coller, uslead of the lingth of the committee of orequire an abunounal po The bolling Gening Expension Than afthe counter to beade twice as long as the windle

for a 1500 lb delivery wagon or nearly as dependent upon the Extra Expense of a langthened the weight of the Vellice -Commundator of Ethra Copper The much for Caking outlesfeiled to met by a saving off the Covert is two more lin of 2 or 3 cells of storage greater than in the ordina 6 Herry Costing Three Times beryow so that The loss in Vallage when cer cending steep at the same time the heat gradeil is not greater that the los af vallage on a level with of the Mator is Enormouse, burnshed, sparking is Elemented and the follow again The amount of Capper Combenation of ballan who to Every ege the chief is Allotor is af Chemost made double or nearly to Offection Vidrable Charace to that with motors Indu Wight show the wagon also water of desegned, to the End that on Un Dyer will conte steep grade the loss of valling Diack & reduced to a Winum Bythis wearing in a twenty Valt water suches

025 36 mil inchage · Ort Inn. Cafel

Mr. Blue

May 18, 1911.

RESCORD OF HILL CLIEB TEST IN NO. 1 DELIVERY TAGON ROUI. WITH 16 A-8 EDISON CELLS.

Course used for test was Magle Neet hill, measuring 1 mile. One half hour rests allowed after each test.

		Tota		verage . Volts	Amps.	Time Cli	for	Tompor	rature of Comm.	<u>.</u>
lst	climb,	2310	lbs.	17.09	155	15.5	min.	32.5	aoergob	contigrade
2nd	"		"	16.78	152.5	16.5	"	35.5	"	"
3đ	*	,,	"	16.13	153.23	17.	11	42.	"	"
4th	**	"	"	15:72	151.17	17.5	"	40.5	"	"
5th	"	**	"	15.25	153.33	18.	**	39.5	"	"
6th		"	"	14.73	151.5	19.5	**	50 - 출	**	**
7th		**	**	12.92	156.34	25.5	ti	65	**	"
8th	Tont	tip	.1	of a mile	and st	alled	, com	ld run	along	on level
		81	only							

The commutation was perfect throughout the above tert. Roads fair. Batteries fully charged at first.

June 23, 1911

The present practice in the manufacture of electrical trucks and uncending is to use a relatively large nucher of sells and high voltage, sor instance, the concervial voltage now used rarge from 40 to 50 in the small electric run-mounts to as high as 110 or 115 volts, in the large sottor-driven trucks.

The use of such voltages requires a compartitively large number of battery cells, and makes the outfit relatively expensive to construct and maintain.

such an equipment is also much more liable to troubles from grounds or leakage in the wiring, but terios, or motors, than would be the cace if a considerably lower voltage was available or practicalle.

We have found that by cortain modifications in the motor construction and arrangement of cells that a much lower voltage can be used efficiently for the above purces, thus accuring relatively inexpensive equipment and all the advantages of a low voltage at the lattery and motor.

In order to main in the same horse-pour output in an equipment of any given size, it is, of course, measuring that the current input to the motor be increased in projection as the voltage decreases. For example in an automotion of the course of the cours

following reportions in motor construction give the most satisfactory result in practice. Actremon is to be had to the Aigureal Larl Shoreth, in which dig. 1 shows a side olevation and saction of a motor proportion of as set as a case point of the saturation and saction of a motor proportion of as set as a case point is vound with the average of the cotor which supports the Larl Type and each point is vound with the avy co. par style. The erasture of is of the ironclast type with the tinning imbeded in alots beneat the terror at the core. The winding intended in slots beneat the terror than one turn or coil of vire is used. The working face of the community is a relatively large to longit or the winding the core of the community of the current with the least portfol brushes are used to community the current with the least portfol brushes are weed to community the current with the least portfol brushes are weed to community the current with the least portfol brushes are weed to community the current with the least portfol process are weed to community the current with the least portfol process.

segments of the commutator is reduced to a very small amount in a 20 volt winding, therefore, there is no tendency whatever to spark or flash under heavy loads.

Actual service con itions chor that an electric websice having a normal land current of say 76 appears on the lavel, running at a given speed my require 200 to Under these conditions in sems grades or on had runded. Under these conditions in sems grades or on the runder conditions of sems grades or on the runder relatively small consultator and light winding in the relatively small consultator and light winding in the armsture and field will investibly break door or burn out, a motor constructed as specified herowith will a tand those that of the sems of the sems

Oring to the low voltage used a motor may be exposed to water and extreme weather conditions without any damage whatever, and such a motor is well adapted for continuous use in unskilled hands.

To number of connections between the cells requiring strending spreaty revised. For instance the 60 coll equipment which is frequently used at the present time has over 180 separate connections at the bettery, while a 16 cell equipment delivering 20 volts start.

Owing to the low voltage used in this system it is not necessary that the motor be made completely water, wood; it may be left relativel open so that active and free venithation on 11 parts of the winding, and the obscutation is a surved. This is a valuably feature when constitution is a surved. This is a valuably feature when constitution would consider the constitution overload, for in our survey of the continuous overload, the constitution of the constitution of the consideration of the constitution of the constitutio



Hr. Dyer:-

I hand you herewith a specification intended to cover Mr. Edison's invention of a low cost storage battery and motor outfit for vehicles. I have carefully considered your suggestion to prepare diagrams comparing the design and characteristics of this motor with those of motors of standard design, but have not been able to evolve any such diagrams of a satisfactory kind. I am sure you fully realize the difficulty of drawing claims to cover an invention of this character.

HL-JS

As you know Mr. Edwar leves
Widnesday aroung, so that his asymptotic
to this explaintmen should be seemed
today or townson.

Lanaham

Commel Electric 20 web motor of the Present of the

CIAIIJ Ith queter Our setur motor

Just for Elec Cirs on #2 Wagger Roter 100 place in Part | Villo Cist 9°R | load 150 amps |

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Mr. Edwan,

I am fording great difficulty in drawing allowable claim's in this application. The Patent to Parsons shows a generator which may be series wound and In which the commutator is several times as long as the armature . (See fig 5.) Persons apparently fully realized the necessity for low internal resustance where large currents are carried. Parsons shows a high speed machine, but the B. E. Bullation shows a low speed generator having an abnormally long commutator. It so of course old to use a series motor with an Edwar

battery, and we shall have to convenie the Patent Office that something more has been done than merely suitably. designing a motor for operation on large currents. In our amelt we shill have to elect between clo for a motor per se, and als on the combination of a motor and a kattery. Which shall we choose? In the example given in our Ofece freation the internal resistance If the motor is . 026 ohms . How much greater metamone position can be employed and still be within your mounting. Lanahan

Recol from Mr. Edwar Jan 5, 1914

Deating Dynamas of low Vallage 3 to 6 Vallage 3 to 6 Vallage 3 to 6 Vallage giving 1500 to 1500 Raw Deeds of 1000 to 1500 Raw Lave 6000 constructed with Communications twice the length of the own callor windless or with continuous core.

Lighapeed low resistances Dynamics, sundian to peating Dynamics with Communications sometimes 2 times can dong as the action length of the armalium drugen bey Jurbun at abnormal opened of from 10 to 30,000 revolution from municat Carryens Very large Current have been made

long armature is he same time deminish but a fraction of those the pressure of Each Carbon Coursed by the plating bruch to less that that deprous so at the ? nomenally used so the high speed turbino dynamo. resestance Colombia In feel the commutator af the bridge of Courton garan The Commendator to far in Excess exthat barry shall be very high recessary to carry So as to enduce arematture the Current Topener ated of woods by short cereculing universally adapted Coils of also to reduce The gain obtained by usu the sparking That Takes such an aGnormal length place on heavy loads to the least ouvelle of asendure relatively to cereount a siender Me Vallage & Current is unnassing the use, to see used The resestance at the commelder of Committeling poles dother devices to pare to the smallest possible the Commitalor from Certic depromunit + at

m Landan Jamary 207 1947

Mr. Edison:-

FOLIO 7% - Storage Battery Motor Sete

this application relates to the use with a battery of the Edison type of a series electric motor of low internal resistance having a long commutator and large brush and commutator contact area. The claims read as follows:

- vehicle, the combination of a driven member required to transatt torque varying through wide limits, a series electric motor operatively coincode to said member for driving the same, and a storage barry at a rate in excess of normal, necessary and sufficient to operate the motor to cause the driving the same, and a storage barry at a rate in excess of normal, necessary and sufficient to operate the motor to cause the driven member to transmit the maximum torque required, said motor having on internal resistance in both field and ammature and the control of the driven as required by the rules of ordinary design for vehicle motors, substantially as described.
- 2. In apparatus of the class described, the combination of a driven member required to transmit to reque varying through wide limits, a series electric motor operatively connected to said member for driving the motor operatively connected to said member for driving the motor operatively of dishbarring at a rute in excess of normal, necessary and entificient to operate the motor to cause the driven member to transmit the maximum torque required, said motor baving low internal notioning react to substantially all minimate sparing even when the motor is supplied with current at the aforesaid excessive rate, substantially as described.
- pulsion of me electric rehiels, the combination of a driven member adapted to transmit torque varying through wide limits, a serie electric motor of low internal resistance operatively connected to eath member for driving the same, and a low voltage etcrase battery for emplying ourrent to the meter capable of discharging at a rate in excess on cormal, necessary and sufficient to the assume torque required, eather the member to the commitator length equal to or cause the driven member to the commitator length equal to or consistent of the commitator length and to be a strain of the commitator consistent of the commitator contact area at least twice as great as is required by the rules of ordinary design for vehicle motors, substantially as described.

These claims have been finally rejected, the position of the Examiner being stated as follows:-

"The applicant has taken a wall known type of battery, expressly designed for use where sudden heavy overloads are frequent, and particularly for driving motors on vehicles, and has exercised only the skill to be accessed to the same of the state of th

The prior art shows dynamo electric machines having low internal resistance, long commutators, and large brush contact areas with resulting low current densities at the brushes. We have presented the arguments for the allowance of the claims as strongly as possible, but have been unable to persuade the Examiner that there is anything patentable in the case. The question now is whether you wish an appeal taken to the Board of Examiners-in-chief. I do not believe that such an appeal would be successful.

The claims as now presented cover the combination of a storage battery with a motor having cortain characteristics. When the case was filed it contained claims for a motor. See original claims 4 and 5. These claims were divided out in compliance with an Office requirement. I do not believe there is patentiable subject matter in the motor por se as disclosed in this application.

The only limitations we could put in claims in this application to cover the motor would relate to the abnormally extended area of brush contact with the commutator, length of the commutator the same or greater than the amature, or commutator twice as long as the armature, and abnormally low field resistance. The Examiner has already substantially held that these features are morely a question of design and not patentable. Please also let us have your decision as to whether you wish such a divisional application filled.

Henry Canakan

HL-JS

If you dende to take an affect, do you wish The. Bull to argue the case ?

Mr. Holden: ;
On the state of grant the ?

On F 772 ?

Or gar

Or ga

Patent Series

Patent Application Files

Folio # 773 Sound Records and Process and Apparatus for Making Same

Serial #: 642377

Primary Applicant: Edison, Thomas A

Date-Executed: 8/1/1911

Orange, New Jersey.

Applicant.		Address.	
Thomas a Redi	ia	p. enemes 11 - en/1000/mass	
	-	- 11 to 12 t	
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Filed August 4	d 1911.	Examiner's Room N	0
Assignee			
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15		FRANK L	

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON a citizen of the United States, residing and habing a Post Office address at

prays that letters patent may be granted to him for the improbements in

Llewellyn Park, West Orange, Essex County, New Jersey

SOUND RECORDS AND PROCESS AND APPARATUS FOR MAKING SAME

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration No. 560), of Grange, Acts Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and annendments therein, to receive the patent, and to transact all business in the Patent Office connected theretwith.

Thomas & Edixon

SPECIFICATION

TO ALL WHOM IT MAY CONCERN: -

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, Essac County, New Jorsey, have invented certain new and useful improvements in SOUND RECORDS AND PROCESS AND APPARATUS FOR MAKING SAME, of which the following is a description:

My invention relates to an improved sound record, preferably of that type which consists of a base or backing of one material, usually a molded material, and an outer surface veneer or covering of another material, which receives the sound record, and also to an improved process and apparatus for making the record. The principal object of my invention is to produce in a quick and efficient manner an improved sound record which will be strong and durable and have no air bubbles or other imperfections in the record surface, and which will permit a large number of reproductions without sensible wear. In accordance with this object, I apply the outer surface veneer in a plurality of exceedingly thin layers to the base or backing, thereby obtaining a record surface of a high degree of homogeneity and perfection. Other objects of my invention will appear more fully in the following specification and appended olaims.

I prefer to employ for the outer sound record surface or veneer a hard solid material, preferably a

recincue body like chellac, which ic colid at ordinary temperatures. As a suitable material for the base or backing of my improved record, I prefer to use Montan wax impregnated with about 7% of cotton flock or other fibrous material. By the use of this fibrous material with the Montan wax, I secure a high degree of durability for the base, the fibrous material being completely penetrated and enclosed by the wax-like material, and at the same time controlling in a degree the expansion and contraction of the base. If desired, inert powders may be mixed with the Montan wax and flock to further control the expansion and contraction. A record made of the specific compositions mentioned above has substantially the seme coefficient of expansion for the backing and the surface veneer, so that there is no danger of the record becoming cracked under changes of temperature. Such a record is also very durable and may be subjected to comparatively rough treatment without any objectionable injury. While, however, I prefer to use the specific compositions mentioned, my invention is not limited thereto, and various other materials or compositions may be used.

In making a record having a surface veneer or covering of chellac, the shellac is diesclived in slochel or any other cuitable solvent, and the colution obtained is applied in a plurality of exceedingly thin layers to the base or backing. I then preferably mount the backing upon a rotating mandrel or other cuitable support and apply the colution thereto by means of a bruch of camel's heir, or in any other cuitable way. It is underetood,

of course, that each layer is permitted to dry before the next layer is superposed thereon. After a sufficient number of layers of the shellao solution have been coated on the blank, the latter is placed in a room or even heated to a suitable temperature for expelling the excess of solvent to permit the record to harden upon cooling. have found that if five or six layers of the shellao solution are coated upon the backing, that the record tablet may be hardened by placing the same in a room hoated to about 120° F. for about four hours. The tablet with the hardened surface veneer is provided with the record impression in the manner hereinafter described or by any other suitable process. By applying the surface coating in a number of thin layers as described above, the coating or veneer not only has a more even texture, but may also be dried and hardened upon the backing in but a small fraction of the time it would take to dry and harden the same if it all were applied as one layer, the formation of air bubbles which is unavoidable when the surface is applied as a single layer also being prevented.

In order that my invention may be more clearly understood, attention is hereby directed to the accompanying drawings, forming part of this specification, and illustrating certain preferred forms of apparatus for making my improved record.

In the drawings, Figure 1 represents a plan view of a support for the record tablets or backings;

Figure 2 represents a side elevation, partly in section, taken on the line 2-2 of Figure 1;

Figure 3 represents a front elevation of a modified form of supporting means for the tablet or backing; and Figure 4 is a central vertical sectional view of a suitable device for forming the record impression in the surface covering or veneer, some of the parts being shown in elevation.

In all the views, like parts are designated by the same reference characters.

Referring to the drawings, the numeral 1 represents a suitable frame or support provided with a plurality of recesses 2 open at one end and adapted to receive and hold in proper position a plurality of racks 3, each provided with a vertical lateral flange 4 in which a plurality of record supports 5 are rotatably mounted. Secured to each of these supports 5 is a pulley 6 adapted to be rotated by a cord or belt 7 which is engaged over the pulleys 8 and 9 rotatably mounted in opposite ends of the flange $\underline{4}$, the pulley $\underline{9}$ being preferably mounted in a vertical ear or projection 4' on said flange as shown. order to provide a large are of contact between the cord or belt 7 and the pulley 6, and thereby insure the efficient driving of the latter, idle pulleys 10 are provided. pulleys engage the cord or belt 7 on opposite sides of the pulleys $\underline{6}$, the pulley $\underline{8}$ taking the place of one of the end idlers. The pulley 9 is rigidly connected with and retated by a gear wheel or other suitable driving means 11 adapted to detachably engage a pinion 12 secured to the shaft 13, which is rotatably mounted in the standards 14 on the base 1, and is driven in any suitable way. Referring to Figure 1, it will be seen that a gear 12 is provided on the shaft 13 for each of the racks 3. It will also be seen that the driving means 11 and 12 are automatically connected and disconnected when the racks 3 are slid or otherwise inserted in place in the recesses or grooves 2 and removed therefrom.

In using the record support described above. a base or backing is mounted upon each support 5, and the desired number of racks 3 placed in position in the recesses \underline{z} of the base $\underline{1}$, the gears $\underline{11}$ of the various racks being automatically engaged with the pinions 12 by this operation, so that all of the backings are placed in rotation by the rotation of shaft 13. A brush, such as that shown at 15; is then dipped into a solution of the material of the surface covering or veneer, and this solution is applied to the various backings, beginning with the first backing on one rack, finishing this rack, then coating the backings on the next, and the various following racks in order until a suitable number of backings have been coated. The number of racks may be so chosen that the tablets first coated will be dry and ready for another coating as soon as each coating has been applied to all of the tablets. A sufficient number of layers or coatings are applied in this way until the veneer has the desired thickness. The thickness of the solution applied may obviously be regulated at will, but it is preferable to have the same rather thin so as to obviate the production of imperfections in the surface coating.

After the surface veneer or coating has been applied, the racks 2 are detached from the base 1 and placed 1 into a suitably heated room or oven, where the excess amount

of solvent for the surface material is driven off, as hereinbefore described, so as to place the record in condition for hardening upon cooling to normal temperatures.

The blanks formed as described above may be provided with the record impression in any suitable way, Figure 4 illustrating a convenient form of apparatus for performing this operation. In this figure, 16 ropresents a suitable mold having the matrix 17 formed on the inner surface thereof. A core 18 provided with a central passage 19 and a transverse passage 20 extending across the core and communicating with the passage 19, has a jacket or envelope 21 of rubber or other elastic material placed upon the same, this envelope being secured to the core by means of the inturned ends thereof. The outer end of the mold is closed by a member 22, which may be secured in position against the upper end of the jacket by means of a taper key 23, which may be forced in position in a slot in the neck 24 of the core 18, so as to force the core and the member 22 into looking engagement. A jacket 25 or other suitable means is placed around the matrix, so as to heat or cool the same as desired.

In forming the record impression in the blank, formed as described above, the blank, professibly in a somewhat plastic condition, is placed on the outside of the rubber envelope 21, and the mold 16 placed in position on the outside of the blank. The upper end of the mold is then closed by the member 22, which is looked in position by the key 23, and fluid under pressure is admitted to the interior of the rubber jacket 21 through the openings 19

and 20. After the application of sufficient pressure, the latter is shut off, and the finished record removed from the apparetus. In order to shrink the record from the matrix, a suitable cooling fluid may be passed through the lacket 25.

In Figure 3 I have illustrated a tablet support adapted to be used in a modified process. This support comprises a eingle mandrel 27 ecoured to a shaft 28 rotatably mounted in a bearing or support 29, and having secured at ite end opposite that supporting the mandrol a pulley 30 adapted to be driven from any emitable driving meane. An ejector comprising a boll orank lever 31 pivoted to the support 29,/a slide 32 pivoted at one and to the upper arm of the levor 31 and provided with a slot 33 whereby it is slidably mounted on the guide or button 34, is provided to conveniently loosen the tablets from the mandrel 27. The slide 32 has an up-turned flange 35 at the end adjacent the tablet, thie flange being adapted to engage the adjacent end of the tablet and shift the latter longitudinally of the mandrol 27 when the outer end of the herizontal arm of the lever 31 is depressed. A tension spring 36 secured at one end to the support 29 and at the other end to the slide 32 is provided to retract the slide 32, and to place the ejector in inoperative position when the ejecting force is removed from the outer end of the horizontal arm of the lever 31.

In employing the device disclosed in Figure 3, the backings or bases for the records are supported upon

racks in a suitable number of trays and applied consecutively to the mandrel or support 27, a fine coating being applied to each tablet while the same is supported on the mandrel 27, preferably by a brush 15" extending the width of the tablet, as shown in Figure 3. This brush should . be given a slight lateral back and forth movement to prevent the layer of surface material applied from becoming streaky. The trays may be supported upon a carriage mounted upon tracks, so that they may be conveniently moved along past the support on which the tablets are coated. After each of the backings has been coated, a second coating is applied, and the operation is repeated until the proper thickness of surface material is attained. After this, the trays supporting the record blanks may be placed in a heated room to drive off the excess of selvent in the surface material. The record impression may be formed in the surface veneer or coating in the manner hereinbefore described, or in any other suitable way.

It is to be understood that my invention is not limited to the exact details hereinbefore set forth, but is as broad as indicated by the terms of the appended olding.

Having now described my invention, what I claim as new and desire to protect by Letters Patent of the United States is as follows:-

A cound record composed of a bace and a surface veneer of record material applied in a phurality of thin superposed layere, substantially as described.

- A sound record composed of a base and a surface vencer of a hard resin applied in a plurality of thin superposed layers, substantially as described.
- A sound record composed of a base and a surface veneer of shellao applied in a plurality of thin superposed layers | substantially as described.
- 4. A sound record composed of a base and a surface veneer of a hard resin applied in a plurality of thin superposed layers, said base being composed of a material having substantially the same coefficient of expansion as the material of the said surface veneer, substantially as described.
- A sound record composed of a hard wax-like base and a surface vencer of a hard resin applied in a plurality of thin superposed layers, substantially as described.
- 6. A sound record composed of a hard wax-like base impregnated with fibrole material, and a surface veneer of a hard reein applied in a plurality of thin superposed layere, substantially as described.
- A sound record composed of a hard wax-like base impregnated with fibrous material, and a surface veneer of a hard reein applied in a plurality of thin euperposed layere, the material of which said base is composed having

Lancilled lister

substantially the same coefficient of expansion as the maderial of said surface veneer, substantially as described.

- a. A sound record composed of a herd wax-like base imprenated with fibrous material, and a surface veneor of shelld explied in a plurelity of thin superposed layers the material of which said base is composed having substantially the same coefficient of expension as the meterial of said surface veneor, substantially as described.
- 9. The method of making record tablets which consists in quating a base or backing with a plurality of thin supergosed layers of record material, substantially as set forth.
- 10. The method of making record tablets which consists in forming a base or backing, and coating the same with a plurality of thin superposed layers of a hard resin, substantially as set forth.
- 11. The method of making record tablets, which consists in forming a base or backing of hard was-like material, and coating the said base or backing with a plurality of thin superposed layers of a hard resin, substantially as set forth.
- 12. The method of making record tablets, which consists in forming a bade or backing of hard wax-like material impregnated with fibrous material, and coating the said base or backing with a blurelity of thin superposed layers of a hard resin, substantially as set forth.

13. The method of meking record tablets, which consists in coating a base or backing with a plurality of thin superposed layers of a record material, causing the coating to dry and harden, and finally forming the record impression in said coating, substantially as set forth.

- 14. The method of making record tablets, which consists in applying to a base or backing a plurality of thin coatings of a solution of record material, and expelling the solvent to cause the costed base or backing to harden, ambatantially has set forth.
- 15. The method of making record tablets, which consists in applying to a base or backing a plurality of thin coatings of a solution of record material, allowing each coating to dry before the application of the next, causing the coated base or backing to harden, and finally forming the record impression in the surface coating, substantially as met forth.
- 16. In a device of the class described, the combination of a plurelity of rotatable tablet supports, a plurality of independently portable bearings therefor, rotatable driving means, and means whereby the rotation of said driving means may be imparted to said tablet supports, substantially as described.
- IV. In a device of the class described, the combination of a base, rotatable driving means thereon, a plurality of independently portable frames adapted to be support

ed on said bass, and provided with rotatable tablet supports, and means whereby the rotation of said driving means may be imparted to said tablet supports, substantially as desoribed.

16. In a device of the class described, the combination of a base, rotatable driving means thereon, a plurality of independently portable frames adopted to be supported on said base, and provided with rotatable tablet supports, and means whereby the rotation of said driving means may be imparted to said tablet supports, said base being provided with means whereby said frames may be positioned so as to operatively connect said last named means to said driving means, substantially as described.

NA. In a device of the class described, the combination with a base, rotatable driving means thereon, a plurality of independently portable frames adapted to be supported on said base, and such provided with a plurality of record supports, means supported by said frames and engageable with or disengageable from said driving means by direct bodily movement of said frames, whoreby the rotation of said driving means may be imparted to said record supports, substantially as described.

20. In a device of the class described, the combination with a base, rotatable driving means thereon. a plurslity of independently portable frames adapted to be supported on said base, and each provided with a plurality of resord supports, means supported by said frames and engageable with or disengageable from said driving means by direct bodily movement of said frames, whereby the rotation of said driving means may be imperted to said record supports, said base being provided with means whereby said frames may be positioned in operative position relatively to said driving means, substantially as described.

Quest a - Wainer 6 - 2 moles Toliz

This specification signed and witnessed this pet day of Cargust 1988

Thomas A Edium

2. Anna R. Neuturn

2. Anna R. Neuturn

State of New Jersep Ss.,

County of Essex

THOMAS A. ROISON , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llowellyn Park, Vest Orange, Lance County,

that he verily believes himself to be the original, first and sole inventor of the improvements in

SOUND RECORDS AND PROCESS AND APPARATUS FOR MAKING SAME

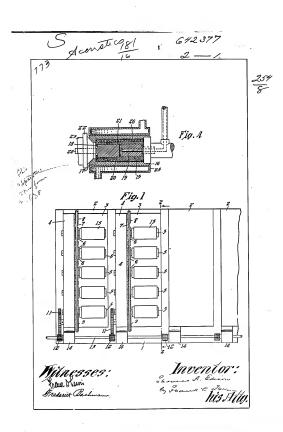
bestribed and claimed in the annexed specification; that he does not know and boers not believe that the same was eiter known or used before his intention or obscodery thereof; or patented or described in any printed publication in the Minited States of America or any foreign country before his inhention or discodery thereof, or more than two pears prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two pears prior to this application; and that no application for patent upon sale intention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 16th day of August 1981

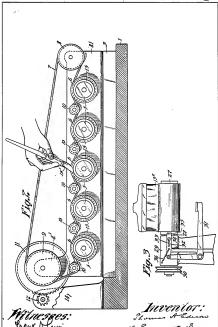
Notary Public

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New Jersey



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Willes 865: Jrank D. Lewis Granic Bachman

Eg Frank to Born. Wis Stay.

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Paper No22 Let.
All communications respecting this
splication should give the series number

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE Sept. 21,1911 .

Thomas A. Edison, WASHINGTON

Care Wrink L. Dyer, " Oriette, Wes Jorsay .

Please and below a communication from the EXAMINER in charge of your application.

for Bound records and Precess and Apparatus for Paking Same, filed (ng. 4,1911, social number 642,377 .

COMMISSIONE OF PORTULA

Claims 1 to 8 inclusive are drawn to a sound record.

Claims 9 to 16 inclusive are drawn to the nothed of making the record tablet.

Claims hi to 20 inclusive are drawn to a modding apparatus. Division is required between these several groups according to the provisions of rule 42 and the title of this invention chould be correspondingly limited to conform with the scope of the claims.

in makingutherex: In magnding this case, applicant should consult the following references:

Petit, Dec. 24,1901,#689,408;

Sanderson, Jan. 25,1910, 3947, 777;

Reynard, Jan. 29,1901,#666,819;

Cupps, Jan. 22,1901,#666,493, all in (181-16);

Miller, et al., May 23, 1905, #790,516;

Ames, et al., May 26,1908,#888,882, helb in (181-14);

Tanbert, Doo. 18,1900, #664, 223, (181-17).

IN THE UNITED STATES PATENT OFFICE

Thomae A. Edieon

SOUND RECORDS AND PROCESS AND APPARAZUS FOR MAKING SAME
Filed August 4, 1911

Sorial No. 542,377

Room No. 379.

HOHORABLE COLLISSIONER OF PATENTS,

SIR:

In response to the Office action of September 21, 1911, please smend the above entitled appliaction as follows:-

Cancel claims 1 to 15 inclusive, and renumber claime 16 to 20 inclusive as 1 to 5.

Add the following claims:-

- 6. In a device of the class described, the combination of a base, rotatable driving means thereon, a portable frame adapted to be supported on said base and proand with a rotatable record support means supported by
 said frame engageable with or disengageable from said driving means by boddly movement of said frame, whereby the
 rotation of eaid driving means may be imported to eaid
 record support, substantially ac described.
 - 7. In a device of the class described, the combination of a base, rotatable driving means thereon, a pertable frame adapted to be supported on eaid base and provided with a rotatable record support, and means supported

by said frame engageable with or disengageable from said driving means by beddily movement of said frame, whereby the retation of said driving means may be imparted to said record surport, said base being previded with means whereby said frame may be positioned in operative position relatively to said driving means, substantially as described.

8. In a device of the class described, the combination with a base, retatable driving means thereon, a plurality of independently pertable frames adapted to be supported on said base and carrying rotatable record supporte, means supported by said frames and engageable with or disaggeable from said driving means by direct bodily movement of said frames, whereby the rotation of said driving means may be imparted to said rocord supports, substantially as accordable.

REMARKS

The requirement for division made by the Examiner has been complied with and action on the morits of the claims now in the case is respectfully requested. The right is reserved to file a divisional application on the subject matter of the canceled claims.

The new claims added herewith are drawn to the same invention as the original claims retained.

Respectfully oubmitted,

THOMAS A. EDISON

Orange, New Jersey

August 10th, 1912.

Div. ...23. Room 379.

Address only
"The Commissions of Patents,
Washington, D. C."

J. H. D. - Sut.

2-200

Paper As Rej .

All communications respecting this proceeding should give the serial number.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Sept. 27,1912.

Thomas A. Edison, Care Frank L. Dyer, Orange, New Jersey . U.S. PATENT OFFICE, SEP 271912 MAILED.

Please fluid below a communication from the EXASUMER in charge of your application.

for Sound Records and Process and Apparatus for Making Same,
filed Aug. 4,1911, sortal number 642,377.

S.B.H.sore!

This action is responsive to the amendment filed Aug. 12,

The title of this application should be limited to conform with the scope of the claims.

Claims 6 and 7 are rejected as specifying only the attachment in Hays, Aug. 1,1911,#999,646, (181-3), or Bawtree, June 2, 1908, #12,002,(181-3).

Claims 1, 2, 3 and 8 are rejected as specifying only a plurality of such attachments as disclosed in Hays or Eastree, adapted to be applied to the machines disclosed in these references

Claim 1 is also rejected upon Spurgeon Jun. 1,1907, #835,902, (181-4). All of the claims are additionally rejected as specifying no more than Comber, Aug. 22,1905, #795,034, or Romano, June 2, 1903, #729, 798, both in (181-4) with interchangeable record wheels or chaims respectively.

Med from Im. Zaus July 18,1911 We

acid from Luis, July 20, 1911.

Patent Series

Patent Application Files

Folio # 777 Manufacture of Fertilizing Material

Serial #: 645838

Primary Applicant: Kiefer, Herman E

Date Filed: 8/24/1911

Counsel, Orange, New Jersey.

FRANK L. DYER,

Thomas a Edison

ine Edison Portland Cement Co.
OM: OTRAINMAN OF BOARD Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J. PREMINDENT Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J. PRIMACE OFFICES. New York, N. Y., St. James Building New York, N. Y., St. James Building New York, N. Y., Note of the Bu
BOSTON, MARS. P. O. ADDRESS, STEWARTSVILLE, N. J. RECT & AMPT. THEAS. P. O. ADDRESS, STEWARTSVILLE, N. J.
June 1, 1911, Jecune
Mr. Thoe. A. Edison,
Edicon Tohomatony Part alast
Orange, N. J. Weller and the later than the formation of the formation of the state
Dear Sir:
Experiments on proposed Fertilizer
In accordance with your notes on the original
Dear Sir: Experiments on proposed Pertilizer In accordance with your notes on the original letter I have secured the following to date: Orthoolase Prof. Hart of Lafayette College to the secured to the secured the secur
Orthoplace Control
Prof. Hart of Lafayette College is
working on a separation of potash and alumina, and has
about 200 lbe. of good orthoclase which he tells me is
supposed to contain about 13% of potash. We have secured
about 5 lbe. of it for our tests.
Phoephate Rook.
We have also secured 5 lbe. phosphate
rock from Baltimore, which analyzes as follows:
Lose on ignition - 1.48 per cent
Phosphoric Acid (P205) - 37.58 " "
Lime - 48.13 " "
We have ground these so that it passes a 200 meeh
eieve, and made mixtures as followe:

June 1 1911

Mixture #1

l part of feldspar

1 " " phosphate

Mixture #2

l part of feldspar

2 parts " phosphate

Mixture #3

2 parts of feldspar

1 part of phosphate

We have tried fusing all of these in a blast lamp, and find that it can be done. I enclose you under another cover, epecimens of each, which you will note are fused only on the outside. Unfortunately we cannot get neat enough to fuse it in large quantities.

We have not made analyses of them, as we do not have the platinum ware necessary for alkali determinations. Moreover, we only have two men who could make such analyses, and all three of us are so busy on coment work, that I hesitate at this time (when shipments are heavy) to take the time myself, or to take them off their regular work. I do not like to take any chance on our regular work (even if we had the platinum) to investigate what may be a phantum.

These samples show that it can be fused in a rotary kiln, and if done, these materials ought to show the following calculated analyses, provided the potash does not go up the stack.

Phosphoric Acid - 18.97 25.45 12.65 Potnesh - 6.55 4.45 8.75 Lime - 24.25 32.45 15.15

If you are still interested in this, and would arrange to have Silver Lake Company fuse it in larger quantities, I could make them up mixtures of say a pound each, and after it is fused, find out the composition and the probable effect on the phosphoric acid and alkali. Part of the alkali in feldspar can be extracted by boiling water. I am under the impression that after this treatment it might all be extracted this way.

We are trying to get samples, analyses and prioss in carload lots of phosphates in order to ses if there is any possibility of making it a commercial proposition.

Have you any further suggestions?

You will note that the ingredients of highest commercial value - i.e. potash and phosphoric soid, vary

as they must according to the proportions, but as these each sell at the rate of about 6 per lb. in fertilizers, the best mixture would be the one with the high test total provided it would have the same value in a double fertilizer. The commercial phosphate alone would have a fertilizer value of 37.5% X 2000 lbs. or 750 lbs. X 6 f or \$45 per ton, but we know that commercial phosphate does not cell at that price, because it is not all "available" - whether rotary kiln would make it available is the question? The other question is that it is cheaper for the farmer to buy phosphate alone than to pay 6 for it in a mixture, but if our mixture of potash (from a cheap source as feldspar) makes them both available, then a cheap cost of production would put them on the same basis as present potash-phosphoric fertilizers, and it should command the same price which we are now paying. For instance Mixture #1

Phosphoric Acid 18.9% X 2000 lbs. X 6 . \$22.68

Potash 6.5% X " " X 6 . 7.80

Mixture #2

Phosphoric Acid 25.4% X 2000 Lbs. X 66 - 30.48

Potash 4.4% X " X 66 - 5.28 35.76 per to

29

Mixture #3

Phosphoric Acid 12.6% X 2000 lbs. X 6 6 - \$15.12

Potash 8.7% X " X 6 6 - \frac{10.44}{25.55} per ton

The question is will a partial fusion (clinkering) or even complete fusion of foldspar and calcium phosphate, set up new relations between Silioa - Alumina - Potsah - Lime and Phosphoric Acid, similar to the unstable nature of Fortland Cement so that both potash and phosphoric acid will be in a shape acceptable to fertilizer chemists as "available"? If so, this looks like a good proposition.

The minor suggestion of fusing limestone and feldspar, so as to make potash available, might even be a good idea, but if you get lime and phosphoric acid in the same material for fluxing with the feldspar, it is all the better.

Very truly,

HEK/KSM

Thomas a Edison

The Edison Portland Cement Co.

J. LANGOR THOMPSON, VIGE-PERSON
J. LANGOR THOMPSON, VIGE-PERSON
II. J. MILLER, THEASURER

P. O. ADDRESS, STEWARTSVILLE, N. J.

uly 20, 1911.

Mr. Thos. A. Edison,

ange,

J. dear the best of the start o

Complying with your instructions I have

had Mr. Dyers office look up all the patents on feldspar limestone and feldspar phosphate fertilizers. Out of a great number I have picked out the following worthy of note.

LIMESTONE & FELDSPAR

BLACKMORE PATENT #513001:

He uses a <u>scaled</u> furnace and also a chloride. Rotary kiln is not even suggested.

CUSRMAN PATENT #597818:

Uses feldspar limestone and a chloride but no mention made of rotary kiln.

PHOSPHATE AND FELDSPAR

BICKELL PATENT #16111:

No mention made of a rotary kiln. This is nearest to our idea.

Mr. Edison.

7-20-11.

PHOSPHATE AND LINESTONE

STILLMAN PATENT #305249:

Does not powder the material or use

rotary kiln.

HODGKINS PATENT #423320:

Unes lime and phosphate but not rotary kiln. In fact process is quite different.

Uses fluorspar also and does not use

rotary kiln.

COATES PATENT #514696:

Uses carbonate of lime and phosphate of lime but not rotary kiln.

None of these cover our idea of phosphate and feldeper in rotary kiln. In fact none of them of any kind use rotary kiln. If the Patent Office will grant several patents for the sems materials using different methods of procedure I should think they would allow our phosphate feldepar idea, when we specify rotary kiln in connection with it. There is a greater similarity between some of these patents than there is Mr. Edison.

7-20-11.

between any of them and our ideas.

Regardless of the patents I shall prospect the mountains around here as time permits and try to locate the feldspar you spoke of.

Have you any suggestion as to further work with a view of application for a patent? Very truly,

HEK-GES

St. Esciepe

P.S.

Since writing the above I attended the Fertilizer Convention at Atlantic City, and heard several good talks by experts on Phosphoric Acid and Potash. I also had 2 hours private talk with Dr. Cameron of the U. S. Bureau of Soils and learned a great deal. Shall make a separate report on it. To summarize the whole thing I think if we get the potash feldspar we will be all right, patent or no patent, but I also believe a patent would be granted on the process I have outlined.

July 22, 1911.

Fr. Thomas A. Edison,

Grange, P. J.

Dear Sir:-

l wrote you yesterday concorning my tolk with Dr. Comeron, of the ". S. Bureau of Holle. We thoroughly confirmed my previous opinion that "moluble" and "smoluble", and "mewiloble" and "unaveilable" in reference to phosphoric acid and potosh are only relative terms and in either case it is all aveilable in time. Of the dozene of methods of analyses, none of them will determine how readily "aveilable" either constituent is an to time.

Custon has led to the belief that monemorie and in natural phosmates and motach in feddings are in the so-called "unavailable" others. If we make any change whetever in the tire nature, chemists are up in the air as to how available either potash or phosphoric oxid become.

For instance in Themas slor, fortilizer chemists permit an analysis for total phosphorous and make no otternt to divide it into "available" and "unavailable". If we make a slog in a rotary kiln no doubt fortilizer chemists will take the make viow as we shall have a similar commound and have a right to demand treatment similar to the Themas slag.

No doubt they will grant it to avoid controversy.

So much for that. Cuchman has covered rotary kiln process for lime, carbonate of lime and foldeper, but a cen no research why we can not patent rotary kiln process for phosphate of lime and foldeper.

there is for more money in the double fortilizer than the feldspar limeatone alone, but it we can not protect it by patents the Bouthern coment mills would beat us out on freights on phosphate. Thomshate rock on a basis of 72 triphosphate of line is that quoted at 3.75 err ton f.o.b. cars it. Pleasant, 'enn., with a moor demand for it. Am getting freight mate to one whore we stand.

I dill think the process is potentable, and enclose you a rough cony of promoted andant medifications. You will note that it is quite different from any of the patents I sent you. Bickell potent to the nearont, but my idea is radically different from his. If you think well of it, have Ir. Dyer express an opinion whether an idea on the lines I have indicated is sufficiently different from the others to have a standing in the latent office. If we get it patented, it will at least have an effort in cousing Couthern easent plants to hesitate before going into it.

Ginco writing the above, I have your note to go sheed, and an mending a copy of this letter and specifications, etc., to Tr. Over. The heat may to mettle it is to have the ratent effice reject it if it is not now.

. i . K.

FORY 47A



The Edison Portland Cement Co.

Тиомак А. Кінен, галіням ортоля W. н. Мальнер, ревораму Л. Інгон Тионгов, сик-рекенцет П. У. Милен, тяканцев W. M. M. Порик, кору в дост. учках.

P. O. ADDRESS, STEWARTSVILLE, N. J.

NEW YORK, N. Y., Bt. James Building Newark, N. J., Union Suilding Union Suilding Savahnan, Oo., National Bank Buildi

July 22, 1911.

Henry Lanahan, Esq.,

Legal Dept., Edison Lab'ry., Orange, N. J.

Dear Sir:-

Copies of various alkali and phosphoric acid processes have been received and after going over them carrefully, I see no resson why a patent chould not be granted on the lines on which I spoke.

Have had it up with Mr. Edison and he instructed me to explain to you and apply for a patent on it. I enclose you copies of the various patents and a copy of a letter to him, snowing why I think my idea is just as essentially different from any or the existing patents as any one of them is from another. It seems to me the simplest way is for me to draw up a rough draft of an application, as I think it chould be drawn so as to avoid the claims in the other patents which will no doubt have to be revised. I think it covers the essential points and shown you want I om driving at.

Please compare this with the patents which I return, and let me have your opinion se to whether it is

or ic not in conflict with the other patents, also any suggestions you have. I can then re-write specifications and claims and again return to you for revision.

Please return all the patents and papers to I can give them further study after getting your suggestions?

Very truly,

Dot soluter

HEK-RES

August 5, 1911.

Dr. H. E. Kiefer, c/o Edison Portland Cement Co., Stewartsville, N. J.

Dear Sir:-

I enclose herowith draft of specification covering your invention in the manufacture of fortilizing material. After you have looked over the same, please return it to me with any suggestions as to changes that may occur to you. I will then have the application written in form for filing and sent to you for execution.

Please advise me if an assignment of this invontion is to be made, and if so, to whom. Also please state your post office address to be inserted in the Petition.

Yours very truly,

HL-JS

Enc.

FORW 474

Thomas a Edison

The Edison Portland Cement Co.

W. M. MALLOHT, PRINCES OF ME J. LINCON TROMPON, VICE-PHRONICS II. F. MILLEY, TRANSPORT

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.
THEAL.
P. O. ADDRESS. STEWARTSVILLE, N. I.

August 14, 1911.

Henry Lanahan, Esq.,

Edison Laboratory,

Orange, N. J.

Dear Sir:-

Herewith find patent application with a slight addition. We assignment will be necessary, as the matter is thoroughly understood by the Cement Co.

Hy post office address is #111 No. Fourth Street, Easton, Penna.

Very truly,

repeileiste

HEK-RBS

ENCLOSURE: -

Mr. Dyer:-

I have prepared an epylication on an invention of Dr. H. E. Kiefer of the Cement Company for rendering the potash in feld spar and the phosphoric soid in insoluble phosphate evailable as a fertilizer, which consists in subjecting a finely ground mixture of phosphate rook and feld spar to the action of heat in a rotary kilm. Mr. Edison is interested in this invention, and directed Dr. Kiefer to have the Legal Department file an application on it. When I sent the draft of this epecification to Dr. Kiefer for his approval, I inquired whether an assignment of the invention was to be made. Dr. Kiefer's reply is as follows:
"No assignment will be necessary, as the matter is thoroughly understood by the Cement Company". Please advise me if we shall file the application without having an assignment made, and if so, to whom shall we charge the filing fee.

HL-JS

Please advice me if we non without having an assignment made, whom shall we charge the filing fee.

Huny language.

August 16, 1911.

Dr. H. E. Kiefer, c/o Edison Portland Cement Co., Stewartsville, N.J.

Dear Sir:-

I enclose hereafth your patent application covering the invention of the Hanufacture of Fertilizing Material. Please execute this application by eigning your full name, that is, "Merman E. Kiefer", at the end of the petition on the outside page of the patent application, at the end of the oath, and at the top of the page containing the oath. The signature at the top of the page containing the oath should be attented by a notary public. The red sticker should be affixed to the oath over the place marked "Soal" in such a way as to hold the ends of the ribbon in place and the notary's seal should be impressed upon this red sticker.

After this document has been executed, please return it to ue to be filed.

Very truly yours,

HL/ARK.

General Counsel.

Thomas a Edison.

The Edison Portland Cement Co.

Tringuph, Freight and Passenger Station, NEW VILLAGE, N. J.
A. MALADAY, President
J. M. Maladay, Treatent
J. M. Station, Treasurer
J. M. Station, Treasurer
J. M. El Houris, Sevendent
J. M. Bouris, Sevendent
J.

PHILADELPHIA, Pa., Arcade Buliding NEW YORK, N. Y., St. James Buliding NEW YORK, N. J., St. James Buliding NEWARK, N. J., St. James Bulg. N. Y BORTON, MASK, Post Office Square Bid.

February 14, 1912.

Mr. Henry Lanahan, Legal Department, Edison Laboratory, Orange, N. J.

Dear Sir :-

Some time ago we had nome correspondence concerning application for a patent on rotary kiln process for burning phosphate rock, granites, or other rock conteining potash. At our lest interviaw there was one patent atill to be heard from, but wa do not believe this will interfere with the process in question.

Will you kindly forward us all sepers on the same, so that we may outline the matter a little further, and see what can be done in the way of securing patent.

Very truly,

ly, Chemiat.

HEK-RBS

Feb. 15, 1912.

Dear Sir:-

Your letter of the 14th inst. addressed to Mr. Lanahan hae been received, and he has requested me to send you our complete file containing your application together with the references cited therein, which application is entitled MANUFACTURE OF FERTILIZING MATERIAL, (our folio No. 777), and which I am sending you today by mail under separate cover.

Please arrange to return this file to me after
you are finished with it, which should be about a month
prior to October 2nd, 1912, at least.

Very truly yours,

ARK.

Clerk.

Thomas a Edison

The Edison Portland Cement Co.

THOMAS A. ROHON, Chairman of Board W. S. MALLONY, President J. LINYON THOMPSON, Vice-President H. P. MILLIER, Treasurer Was R. Honner, Sectrand Assl. Treas.

Ports 47 A

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.



February 17, 1912.

Mr. Henry Lannahan,

Edieon Laboratory, Orange, N. J.

Dear Sir:-

I am in receipt of papers pertaining to Phosphate Patents but do not find a copy of Gushman's patent #857992. It is not necessary to have the patent in full but some years ago I was a regular reader of the Patent Office Gazette and if this publication has not been discontinued you probably have files of it at Grange. The condensed description of the patent covers 10 or 20 lines only and if you will kindly have your stenographer copy this abstract for me it will be of great assistance.

Very truly,

HEK-FS

Chamiet

Sept. 10, 1912

Dr. H. E. Kiefor, Edison Portland Cement Co., Stowartsvillo, H. J.

Doar Sir:-

On Fobruary 16th last, the complete file of your application Felic 777, Manufacture of Fertilizing Material, together with the reference cited therein, was mailed to you from this office. This application should now be taken up for amendment. Will you kindly return the complete file to me as promptly as possible, tegether with your comments and suggestions. The amendment must be in the Patent Office prior to October 2nd.

Yours vory truly,

HL-JS

Thomas a Edison

The Edison Portland Cement Co.

FHOMAS A. Hurson, Chairman of Board W. S. MALLOWY, President L. LINTON TROMPSON, Vice-President L. P. MILLES, Tressurer

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J.

P. O. ADDRESS, STEWARTSVILLE, N. J.

SALES OFFICES:
LADELPHIA, P.A., Areade Building
W YOLK, N. Y.,
WAOK, N. J.,
TON, MASA,
FOR Office Square Bid

Sept. 17, 1912.

Mr. Henry Lanahan, Esq.,

Edison Laboratory,

Orange, N. J.

Dear Sir:-

Herewith find all papers pertaining to the fertilizer process. I have gone over them as time permitted and dealt only with the patents referred to in Patent Office communication of Oct. 2 - 1911. I have attached comments to each of these patents.

None of them conflict with us but Wolters .

is the nearest. If a rotary Kiln be used in his process instead of a Siemane furnace and the material reduced to clinker
only instead of "a fluid molten state" then our process is
anticipated.

Hewberry uses a rotary kiln for a different kind of a fertilizer and if we are not allowed to combine Wolters and Newberrys processes we have no claim but it looks to me as though the adaption of a rotary kiln to Wolters materials is new notwithstanding that Newberry uses a rotary kiln on other fertilizing materials. Of course I do not know.

The Patent Office exception to the large number of claims looks reasonable. We could simplify it by

Mr. H. L. -2- 9-17-1912.

making a few apsoifio claims on the use of a rotary kiln for clinkering a not completely fusing a mixture of natural phosphates and silicates containing alkalies for the purposs of rendering both phosphoric acid and alkalies soluble. There is nothing sless to the process and the simpler we make it the better it looks.

The Patent Office communication refers to "calcining" of phosphates in a rotary kiln. We do more than calcining we carry to incipient fusion.

In visw of the various patents I do not know whether it is advisable to spend much more money on it. Nevertheless I have given you this data and if you think a simplified amendment claiming only what I have outlined above will be granted it might be worth a trial.

Very truly,

Official Chemist.

HEK-FS

RNCLOSURES:-

congrado company.

August 18, 1913

H. E. Kiefer, Esq., Edison Portland Cement Company, Stewartsville, Now Jersoy

Dear Sir:

In compliance with your request of the 14th inst., I am sending you today, by express, the complete file containing your application, together with the references cited therein, said application being entitled Manufacture of Fertalizing Material (our Folio No. 777).

I do not understand that it has been finally determined to drop this application, and in case it is to be dropped, we should like to have Mr. Edison's authority for such action. I should be glad to have your views as to the advisability of proceeding with the presecution of the application, or to have you take the matter up with Mr. Edison personally, if you desire.

The next amendment must be filed in the Office before October 30th, and if the application is to be amended, this file should be returned to the Legal Department not later than the 1st of October.

Very truly yours.

F117

Ootober 8, 1913

Mr. H. E. Kiefer, Edison Portland Cement Co., Stewartsville, N. J.

Dear Sir:-

The next amendment in your application ontitled Manufacture of Fertilizing Material, our Folio Ho. 777, must be filed in the Patent Office before October 30th. The complete file of thie application was eent to you about the 18th of August last. Will you kindly return the same to this department as soon as practicable in order that the matter of the amendment may be taken up. Also kindly let me have your views as to the advisability of proceeding with the prosecution of the application. Very truly yours,

HL-JS

Phoned Mr. Keepin Wet 15, 1913.

Thomas a Edison

The Edison Portland Cement Co.

THOMAS A. ROISON, Chelyman of Board W. S. MALLORY, President J. Linton Thompson, Vice-President II. P. Millain, Tressurer

Telegraph, Freight and Passenger Station, NEW VILLAGE, N.

E. N. J.

PHHADRIETH, P.A. Arcede Holding
NEW YORK, N. Y., St. James Holding
NEW YORK, N. Y., St. James Holding
NEW YORK, N. Y., St. James Holding
NEWARK, N. J., St. James Hold, N. Y.

N. J.

Oct. 15, 1913

Henry Lenahan, Esq., Legal Department, Edison Laboratory, Orange, N. J.

Dear Sir:-

Mr. Mellory and I have discussed the metter very fully and in view of the nerrowness of any claims that might now be slowed, have decided to drop the present application. (F777)

Very truly,

referesto

P. S. Am returning all papers under another cover.

Patent Series

Patent Application Files

Folio # 785 Charging Secondary Cells and Utilizing the Current Therefrom

Serial #: 651697

Primary Applicant: Hutchison, Miller Reese

Date Executed: 9/26/1911

Serial No. 651, 697 A COST. Copy,

Applicant.	Address.
Miller Reese Hutchison West Grange, The	4
West Crause he	w Jersey.
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	leells and retilizing the Coursent Therefrow.
Filed September 28th 1911.	Byaminer's Paam No. 10.5
	Examiner's Room No. 10.5
Assignee Edison Storage B	Battery Company
Autology	. 114.61
Ass'g't Execasor 26.1911. Records	d Sunt 28/11 Liber 15 8 8 Page 26
Patent No.	Issued
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1 mos	FRANK L. DYER, Counsel,
	- Country

The Day Hallow of Bay of A.

Petition.

To the Commissioner of Patents:

Pour Petitioner MILLER REESE HUTCHISON
a citizen of the United States, residing and having a Post Office address at
west Orange, Essek County, New Jersey

prays that letters patent may be granted to him for the improvements in

CHARGING SECONDARY CRILS AND UTILIZING THE CURRENT

set forth in the annexed specification; and he hereby appoints Frank A. Wyer (Registration No. 560), of Grange, New Jerssey, his attorney, with full power of stubstitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected theretwith.

miller Reese Hutchison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, MILLER REFER HUTCHISON, a citizen of the United States and a resident of West Orange, in the Gunty of Resex and State of New Jorsey, have invented certain new and useful improvements in CHAROING SECOND-ARY CELLS AND UTILIZING THE CURRENC TREEFFOM, of which the following is a specification:-

My invention relates generally to a method and means for charging one or a battery of secondary or reversible colls and for utilizing the current therefrom, and more particularly to the charging of such cells from a source of current which in inadequate to charge the cell or battery efficiently in the ordinary manner, and to the utilization of current from one or more groups of elements of much cells at a time. My invention is also particularly adapted to the charging of secondary cells which are located in confined spaces difficult to cool and ventilete.

In modern storage battery development the tendency is toward the employment of large cells, each having a great number of positive and negative elements or plates. This is especially true in submarine boat practice, and is occasioned by the great increase in size of such boats as the art progresses. One of the greatest difficulties met with in the operation of storage batteries in submarines lies in the necessarily inadquate facilities for ventila-

tion and cooling. In such vessele there is not sufficient epace available to permit the provision of large air duots into, through and out of the battery tanke or receptacles. Furthermore, relatively large exhaust ports of this character are not permissible in submarine boat design, because such vessels must have as few and as small outlets as possible, to facilitate water tightness under great hydrostatic pressure. The difficulties of cooling and ventilation are increased where lead or soid storage battery cells are employed. Owing to the fragility of the hard rubber containing jars of cells of this type, it is necessary to reinforce them by placing them in compartments of the battery tank of the boat in such a manner that the fore and aft and cross members of the compartments will support the containing jars and provide the requisite mechanical strength for the same. It is apparent that a cell placed in such a compartment and fitting tightly therein cannot be cooled except from the top. For these reasons and also on account of the poor heat conducting properties of hard rubber and wood, it is found difficult to charge the batteries of submarines in tropical waters within a reasonable length of time because of the injury done to a lead cell by allowing the temperature of the cell to rise above 110° Fahr. These conditions neceesitate charging the batteries for a long time at a low rate, or for a short time at normal rate until the tempereture limit has been reached, and then disconnecting and allowing them to cool before continuing the charge. In the case of storage battery cells of the Edison type, no serioue permanent injury ie done

the cells by charging them at high temperatures. charged in this manner, however, their efficiency for that charge is decreased. When cells of the Edison type are used in submarine boats, the cells may be spaced apart by vertical separators, and the containing cans being of metal, have better heat conducting and radiating properties than those of the lead or soid cells. With this arrangement, air may be taken into the battery tank at the bottom of one end and drawn out from the top of the tank at the other end, whereby a flow of air by and between all the cells is obtained. But even with such an improved installation it is a difficult matter to cool the interior of a very large cell and there is not sufficient space available to permit making the cells up in smaller sizes and paralleling them. In the case of Edison type cells of high discharge rate capacity and low internal resistance, the maximum efficiency is obtained by charging at relatively high rates. For example, while the large tube type cell can be charged efficiently at the 7-hour rate, the small tube type should be charged at not less than a 3-hour or 4-hour rate and is preferably charged at a 2-hour rate where the cells can be cooled properly. The charging of batteries in submarine vessels is often done by driving the motor as a dynamo when the boat is being propelled on the surface by the cil engines. Such motors are seldem capable of furnishing sufficient current to charge the battery in three or four hours, even though the engines be large enough to drive both boat and generators.

The objects of my invention are to overcome many of the difficulties hereinbefore pointed out and to provide

an efficient method and meane for charging secondary cells which require charging at a rate higher than is capable of being furniched by the source of current available when employing ordinary methods, and also to enable current from any desired number of groups of elements of eccondary cells to be efficiently and readily utilized. My improved method consists generally in cupplying current to one or more groups of the elemente or plates of the cells at a time, and also, when desired, in utilizing—current—by taking the from any decired number of such groups of elements.

In order to render my invention more easily underetood, reference is had to the drawing accompanying and forming a part of this specification, and in which the figure illustrates diagrammatically an arrangement of circuits and apparatus adapted to carry out my invention.

In the drawing, accordary or reversible cells are shown at $\underline{\lambda}$ and \underline{B} . It will be apparent that my invention is applicable to a cingle cell or to any number of cells. The positive and negative elements of each of the cells are arranged in groups and each group is preferably provided with its own inculated binding posts or other terminale. I have illustrated each of the cells as divided into four groups of elements. The groups of positive elements of cell \underline{A} are indicated at \underline{A} 1, \underline{A} 2, \underline{A} 3, and \underline{A} 4 and are provided with binding posts or other terminale \underline{A} 5, \underline{A} 7, and \underline{A} 8 respectively. The groups of negative elements are indicated at \underline{A} 9, \underline{A} 10, \underline{A} 11, and \underline{A} 12 and are provided with the binding posts or other terminale \underline{A} 12, \underline{A} 14, \underline{A} 15, and \underline{A} 16 respectively. The groups of positive

elemente \underline{A} $\underline{1}$, \underline{A} $\underline{2}$, \underline{A} $\underline{3}$, and \underline{A} $\underline{4}$ are associated with the groups of negative elemente A 9, A 10, A 11 and A 12 rospectively. The cell \underline{B} has its elements arranged in tho eame manner as those of the cell \underline{A} . The first group of elemente of this cell comprises the positive elements $\underline{\mathfrak{d}}$ $\underline{\mathfrak{d}}$ and the nogative elements \underline{B} $\underline{9}$, the positive elemente \underline{B} $\underline{1}$ having connected therete a binding post or other terminal B 5 and the negative elements B 9 having connected thereto a binding post or other terminal B 13. The second group comprises positive elemente \underline{B} $\underline{2}$ and negative elements \underline{B} $\underline{10}$ provided with binding posts or other terminals B 6 and B 14 respectively. The third group comprises positive elements B $\underline{\mathbf{3}}$ and negative elements $\underline{\mathbf{B}}$ $\underline{\mathbf{11}}$ provided with binding poste or other terminals B 7 and B 15 respectively. The fourth group comprises positive elements B 4 and negative elements B 12 provided with binding poste or other terminale B 8 and \underline{B} $\underline{16}$ respectively. Each of the groupe of elements of each of the celle may comprise the same number of positive elements as of negative elements, as for example, fifteen of each, or preferably there is one more negative element than positive element in each group, as, for example, fifteen positive elemente and eixteen negative elements.

As a means for charging the bettery and as illustrating my improved method, the following arrangement of circuite may be employed:— Direct current mains are shown at 1 and 2 and are provided with suitable terminals 3 and 4 respectively, which are adapted to be connected to any suitable source of current, as, for example, the generator 2, by means of the switch 2, the terminal 3 being in-

tended to be connected to the positive brush or terminal of the source of current, and the terminal 4 being intended to be connected to the negative brush or terminal of the nource of current. The generator D may be a dynamo electric maohine adapted to be driven at other times as a motor by current sumplied from the bettery.

For charging the first group of elements of each cell, a double pole switch 5 is provided, having one terminal connected to the positive direct current main $\underline{1}$ by the conductor 6 and another terminal connected to the negative direct ourrent main 2 by the conductor 7. The terminal of the switch $\underline{5}$ which is adapted to be connected to the positive side of the direct current main 1 through the conductor 6 when the switch is closed is connected to the positive terminal \underline{A} $\underline{5}$ of the first group of elements of the cell \underline{A} by the conductor 8, and the terminal of the switch 5which is adapted to be connected to the negative direct current main 2 through the conductor 7 when the switch is closed is connected by the conductor 9 to the negative terminal B 13 of the first group of elements of the cell B. The negative terminal A 13 of the first group of elements of the cell \underline{A} is connected by the conductor $\underline{10}$ to the positive terminal B 5 of the first group of elements of the cell B. For charging the second group of elements of each of the cells, a double pole switch 11 is provided having one terminal connected to the positive direct current main 1 by the conductor 12 and another terminal connected to the negative direct current main 2 by the conductor 13. The terminal of the switch 11 which is adapted to be connected to the positive direct current main $\underline{1}$ through the conductor 12 when the ewitch is closed is connected by the conductor $\underline{14}$ to the positive terminal \underline{A} $\underline{6}$ of the second group of elements of cell A, and the terminal of the switch 11 which is adapted to be connected to the negative direct current main 2 through the conductor 13 when the ewitch is closed is connected by the conductor 15 to the negative terminal B 14 of the second group of elemente of the cell B. The negative terminal A 14 of the second group of elements of the cell $\underline{\Lambda}$ is connected by the conductor $\underline{16}$ to the positive terminal \underline{B} $\underline{6}$ of the second group of elements of the cell B. For charging the third group of elements of each of the cells, a double pole switch 17 is provided having one terminal connected to the positive direct ourrent main 1 by the conductor 18 and the other terminal connected to the negative direct current main 2 by the conductor 19. The terminal of the switch 17 which is adapted to be connected to the direct current main 1 through the conductor 18 when the ewitch is closed is connected by a conductor 20 to the positive terminal A 7 of the third group of elemente of the cell A, and the terminal of the switch 17 which is adapted to be connected to the negative direct current main 2 through the conductor 19 when the switch is closed is connected by conductor 21 to the negative terminal B 15 of the third group of elemente of the cell \underline{B} . The negative terminal \underline{A} $\underline{15}$ of the third group of elements of the cell A is connected by the conductor 22 to the positive terminal B 7 of the third group of elements of the cell B. For charging the fourth

group of elements, a double pole switch 23 is provided having ons terminal connected by the conductor 24 to the positive direct current main $\underline{1}$ and another terminal connected by a conductor 25 to the negative direct current main 2. The terminal of the switch 23 which is adapted to be connected to the positive direct current main 1 through the conductor 24 when the switch is closed is connected by a conductor $\underline{26}$ to the positive terminal $\underline{A}~\underline{8}$ of the fourth group of elements of the cell \underline{A} , and the terminal of the switch 23 which is adepted to be connected to the negative direct current main 2 through the conductor 25 when the switch is closed is connected by a conductor 27 to the negative terminal \underline{B} $\underline{16}$ of the fourth group of elements of the cell \underline{B} . The negative terminal \underline{A} $\underline{16}$ of the fourth group of elements of the cell A is connected by the conductor 28 to the positive terminal B 8 of the fourth group of slements of the cell B.

When charging the cells, one or more of the switches may be closed at one time, while the remainder of the switches remain open. For example, the switch 5 may be closed first and a circuit is thus established from the positive direct current main 1 through the conductor 5, through one member of the switch 5, through the conductor 9 to the positive terminal \$5 of the first group of elements of the cell \$A\$, through the first group of elements of the cell \$A\$ through the first group of elements of the cell \$A\$ through the first group of the first group of elements of the cell \$A\$. Through the first group of elements of the cell \$A\$ through the first group of elements of the cell \$A\$, through the first group of elements of the cell \$B\$, through the first group

of elements \underline{B} $\underline{1}$ and \underline{B} $\underline{9}$ of the cell \underline{B} to the negative terminal B 13, through the conductor 9, through one member of the switch 5 and the conductor 7 to the negative direct current main 2. In this manner, the first group of elements of each of the cells is charged. After this group of elements has been charged, the switch 5 is opened and the switch 11 closed. The closing of the switch 11 establishes a circuit from the positive direct current main 1 through the second group of slements of each cell and back to the negative direct current main 2. After this group of elements has been fully charged, the switch 11 is opened and the switch 17 closed. The closing of tha switch 17 satablishes a circuit from the positive direct current main 1 through the third group of elements of each cell and back to the negative direct current main \underline{z} . After this group of elements has been fully charged, the switch 17 is opened. The switch 23 is then closed and the closing of this switch establishes a circuit from the positive direct current main 1 through the fourth group of elements of each cell and back to the negative direct current main 2. After this group of elements has been charged, the switch 23 may be opened. Obviously, it is immaterial in what order the switches are closed. Under certain circumstances, it may be advantageous to close several of the switches at a time as, for example, switches 5 and 17 at one time, and 11 and 23 at another. After all the groups of elements have been charged, the source of current can be disconnected from the terminals 3 and 4, as by opening the switch 8.

It will be apparent that I have provided a method for charging a battery requiring a high charging rate from a source of current inadequate to supply current at the charging rate required for the entire battery when charged in the ordinary way. For example, if in the battery illustrated, in which there are four subdivisions, a current of 2400 ampores is required to efficiently charge the battery, the charging may be efficiently accomplished by my improved method from a course of current capable of supplying only 600 amperes. Furthermore, in charging a battery by my improved method, the advantage of having a large quantity of electrolyte is obtained, and the heating is materially reduced both on account of the relatively small current employed and the large quantity of electrolyte present to radiate the heat through the relatively large containing can.

After-the-bettery-has-been-charged, the current-may be-utilized by closing all of the switches 5, 11, 17 and 23, and-current-taken-from-the-battery-by-connecting-the-terminels-3-and-4-to-a-circuit-containing-suitable-translatingdevices, as, for example, the circuit containing the lamps L. by means of the switch S. Or, if desired, the generator D may be run as a motor from the battery by connecting the terminals 3 and 4 to the circuit containing the same by means of the switch \underline{S} . It may also be desired to utilize the current from only one or two or three groups of elements in parallel, keeping the other groups for emergency work. It is well known that the electrometive force of a cell is highest at the beginning of discharge, and current taken from a single fully charged group of elements may be utilized for running the motor on short runs or practice cruises. The recharging of the battery is thue facilitated, and fully charged groups are always available for emergencies.

Having now described my invention, what I claim as new and desire to protect by Letters Patent of the United States is as follows:

- 1. The method of charging a secondary cell, which consists in supplying current to some of the elements of the cell during one period and to other elements during another period, substantially as set forth.
- 2. The method of charging a battery of secondary colls, which countries in supplying current to same of the elements of each cell during one period and to other elements of each cell during enother period, substantially as set forth.
- The method of charging a secondary cell, which consists in supplying current successively to groups of elements of the cell, substentially as set forth.
- 4. The method of charging a bettery of secondary cells, which consists in supplying current successively to a group of elements of each cell, substantially as set forth.
- 5. The method of charging a battery of secondary cells, which consists in supplying current to groups of elements in succession, each group containing one group of elements of each cell, substantially as set forth.
- The combination of a sub-divided secondary cell and means for supplying current to any desired subdivision of the cell, substantially as described.

- 7. The combination of a battery of sub-divided econdary cells, connections between sub-divisions of different cells, and means for supplying current to any desired ect of connected sub-divisions, substantially as described.
- 8. A secondary cell having groups of elemente, each group being provided with terminals, substantially as described.
- A secondary cell having groups of elements, such group being provided with terminule, and means for connecting each group of elements in a separate circuit, substantially as described.
- 10. The combination of a secondary cell having ite slements arranged in groups, and a separate circuit for each group of elements, substantially as described.
- 11. The combination of a battery of secondary celle, sach cell having its elements arranged in groups, and means for connecting in separate circuits one group of elements of each cell, substantially as described.
- 12. The combination of a battery of secondary cells, each cell having its elements arranged in groups, and means whereby separate circuits may be successively established containing one group of elements of each cell, substantially as described.
- 13. The combination of a battery of eccondary \ cells, each cell having its elemente arranged in groupe.

a source of current, and means for connecting in a single circuit with the source of current one group of elements of each cell, substantially as described.

- 14. The combination of a battery of secondary sells, each cell having its elements arranged in groups, a source of current and means for connecting successively in a single circuit with the source of current one group of elements of each cell, substantially as described.
- 15. The method of utilizing ourrent from a secondary cell, which consists in taking ourrent from some of the elements of the cell during one period and from other elements during another period, substantially as set forth.
- 16. The method of utilizing (the) current from a battery of secondary cells, which consists in taking current, from some of the elements of each cell during one period and from other elements of each cell during another period, substantially as set forth.
- 17. The method of utilizing ourrent from a secondary cell, which consists in taking ourrent successively from groups of elements of the cells, substantially as set forth.
- 18. The method of utilizing ourrent from a battery of secondary cells, which consists in taking ourrent successively from a group of elements of each cell, substantially as set forth.
- 19. The method of utilizing current from a bettery of secondary cells, which consists in taking current from groups of elements in succession, each group containing one group of elements of each cell, substantially as set forth.

- 20. The combination of a sub-divided secondary cell and means for utilizing current from any desired sub-division of the cell, substantially as described.
- 21. The combination of a battery of aub-divided secordary cells, connections between sub-divisions of different cells, and means for utilizing current from any desired set of connected sub-divisions, substantially as described.
- 22. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a translating device, and means for connecting in a single series with the translating device one group of elements of each cell, substantially as described.
- 23. The combination of a bettery of secondary cells, each cell having its elements arranged in groups, a trenslating device, and means for connecting successively in a single circuit with the translating device one group of elements of each cell, substantially as described.
- 24. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a translating device, and means for connecting in a single circuit with the said translating device any desired number of groups of elements of each cell, substantially as described.
- 25. The combination of a secondary cell having its elements arranged in groups, a discharge circuit, and means for discharging any desired number of said groups through said discharge circuit, substantially as described.

- 26. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a discharge circuit, and means for discharging any desired number of groups simultaneously through said discharge circuit, substantially as described.
- 27. The combination of a secondary cell having its elements arranged in groups, a circuit, and means for connecting any number of said groups to said circuit, substantially as described.
- 28. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a circuit and means for connecting any number of sold groups of elements to said circuit, substantially as described.

Sweet It for I want to the inch.

This specification signed and witnessed this 26 th day of Leptonde, 1911.

miller Reese Hutchism

Witnesseth:

1. Henry Lanahan

Oath.

State of New Jersey . ss.,

MILLER REASE TUTCHISON , the above unuse petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of West Orange, Rasea County, New Jorsey

that he berify believes himself to be the original, first and sole inventor of the improbements in

CHARGING SECONDARY CELLS AND UPILIZING THE CURRENT THEORETON

described and claimed in the annexed specification; that he does not know and boes not befiebe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two pears prior to this application; or patented in any country foreign to the United States on an application filed more than tunde months prior to this application; or it public use or on sale in the United States for more than two pears prior to this application; and that no application for patent upon said invention has been tiled by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this 2 6th day of deptember 911.

Dotary Public.

[Seal]

Div.26. Room105

Address only
"The Commissioner of Patents,
Washington, D. C."

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Paper No.....2...
All communications respecting this sheatlen should give the serial number,

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DEPARTMENT OF THE INTERIOR

18⁵

UNITED STATES PATENT OFFICE

WASHINGTON January 11, 1912.

Miller R. Hutchison,

c/c Frank L. Dyer,

TYM T.F. 1015

Orange, N. J.

Please flui below a communication from the EXAMINER in charge of your application. for Charging Becondary Cells and Utilizing the Current Therefrom, filed Sept. 28, 1911, Serial No. 661,697.

Commissioner of Patrata.

Division is required in this case between claims 1 to 5, inclusive, which cover an alleged method of charging storage; batteries, claims 6, 7, 9 to 14, inclusive, which are drawn to an apparatus for charging storage batteries, claim 8, which covers merely a specific form of battery cell, and claims 18 to 28, inclusive, which cover an alleged method and apparatus of utilizing battery current.

Further action on the merits is postponed until this requirement shall have been complied with.

As the result of a cursory examination the patents to:

Xing, 655,093, July 3, 1900, 171-Systems, Secondary Battery,
Rnd Cell, and
Flick, 370,134, Sep. 20, 1887, (204-29).

IN THE UNITED STATES PATENT OFFICE

Miller Reese Hutchison CHARGING SECONDARY CELLS AND UTILIZING THE CURRENT THEREFROM Filed September 28, 1911

Serial No. 651.697

Room No. 105

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of January 11, 1912, please amend the above entitled case as follows:-

Page 4, line 9, cancel "utilizing ourrent by".

Same line, change "it" to - ourrent - . Same page, line
20, before "groups" insert - separate - .

Page 10, cancel lines 17 to 20 inclusive and substitute therefor the following - After the battery has been charged, current may be taken from it and utilized by closing all of the switches 5, 11, 17 and 23, and connecting the terminals 3 and 4 to a circuit containing suitable translating -

Substitute the following claims for those new in the application: -

 The method of charging a socondary cell, which consists in supplying ourrent to some of the positive and negative elements of the cell during one poriod and to other positive and negative elements during another period, substantially as set forth.

- 2. The method of charging a bettery of eccendary colls, which consists in supplying current simultaneously to come of the elements of each cell during one period, and supplying current simultaneously to other elements of each cell during another period, substantially as set forth.
- The method of charging a secondary cell, which consists in supplying current successively to groups of elements of the cell, substantially as eet forth.
- 4. The mothed of charging a battery of secondary cells, which consists in supplying current through different paths through the cells during different periode, each path including positive and negative elements of each cell, substantially as set forth.
- The combination of a sub-divided secondary cell and means for supplying current to any desired sub-division of the cell, substantially as described.
- 6. The combination of a battery of sub-divided escendary colls, connections between sub-divisions of different colls, and means for supplying current to any desired set of connected sub-divisions, substantially as described.
- 7. The combination of/secondary cell having groups of elemente, each group being provided with terminals, and means for connecting each group of elemente in a separate circuit, substantially as described.
- The combination of a eccondary cell having its elemente arranged in groups, and a ceparate circuit for each group of elements, cubetantially as described.

- The combination of a battery of secondary cells, each cell having its elements arranged in groups, and means whereby separate circuits may be successively established, each said circuit containing a group of elements of each cell, substantially as described.
- 10. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a source of current, and means for connecting in circuit with the source of current one or more groups of elements of each cell, substantially as described.
- 11. The method of discharging a socondary cell, which consists in taking current from some of the positive and negative elements of the cell during one period, and from other positive and negative elements during another period, substantially as set forth.
- 12. The method of discharging a battery of secondary colls, which consists in taking current simultaneously from some of the elements of each coll during one period, and in taking current simultaneously from other elements of each coll during another period, substantially as set forth.
- 13. The method of discharging a secondary cell, which consists in taking current successively from groups of elements of the cell, substantially as set forth.
- 14. The mothed of discharging a battery of secondary cells, which consists in taking current from the cells through different paths through the cells during different periods, each path including positive and negative elements of each cell, substantially as set forth.

- 15. The combination of a sub-divided secondary cell, and means for taking and utilizing current from any desired sub-division of the cell, substantially as described.
- 16. The combination of a hattory of sub-divided secondary cells, commotions between sub-divisions of different cells, and means for taking and utilizing current from any desired set of commoted sub-divisions, substantially as described.
- 17. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a translating device, and means for commetting in circuit with the translating device one or more groups of elements of each cell, substantially as described.
- 18. The combination of a battery of secondary cells, each coll having its elements arranged in groups, an electrical dovice, and neuns for commerting in circuit with said device any desired number of groups of elements of each cell, substantially as described.
- 19. The combination of a battery of secondary cells, each cell having its elements arranged in groups, a source of current, a translating device, and means for connecting in circuit with either the source of current or the translating device any desired number of groups of elements of each cell, substantially as described. -

REMARKS

The claims have been rowritten for the purpose of better defining applicant's invention and in partial com-

pliance with the requirement of division. In the Office action of January 11, 1912, division was required between groups of claims covering subject matter as follows:-

- (a) Method of charging storage batteries
- (b) Apparatus for charging storags batteries
- (o) A spsoific form of battory coll
 - Method and apparatus for utilizing battery ourrent

In the claims now submitted there is no claim for a storage battery coll per se. It is believed that the claims now presented are properly examinable in a single application. All of the apparatus claims read upon the single figure of the drawing and some of them, for example, claims 7, 8, 9, 18 and 19, covor systems adapted for either charging or discharging a coll or battery or for both. apparatus claimed is adapted for carrying out either the process of charging a cell or battery or for discharging a osll or battery or for both. Furthermors, it is believed that the requirement of division between claims for the method of charging storage batteries and for the apparatus adapted for use for that purpose is not a proper ons. because of the relation between the process and apparatus. In this connection reference is made to Steinmetz vs. Allen. 109 O.G., 549, in which the Supreme Court held that the statute gives the right to join inventions in one application in cases where the inventions are related, the partioular case under consideration being an application containing both process and apparatus claims. In a subsequent decision by the Commissioner of Patents, Ex parte Ament, 116 O.G.,

596, it was held that process and apparatus claims may in some onees be so related as to make it proper to include them in one application, that a requirement of division should not be based upon the broad and general proposition that the process and apparatus are always independent, and that if the Examinor should conclude that the particular process and particular apparatus under consideration are not so related as to warrant including thom in one case, he should state his reasons for this conclusion. more, in ex parte Steinmetz, 117 0. G., 901, where the Steinmetz application was again under consideration, the Commissioner said:- "The sole question presented for deoision is whether the subject matter stated in the process claims is so separate and independent of the subject matter stated in the apparatue claims as to warrant requiring that the claime be presented in separate applications". It is also bolieved that the field of search and classification is the same for all of the claims now in this application. Reconsideration of the requirement of division insofar as it relates to the subject matter of the claims now submitted, and action on the merits are requested.

Respectfully submitted,

MIDLER REESE HUTCHISON

By Frank L. Alyen

Hie Attorney

Orange, New Jereey January 6, 1913. Div. .. 26 ... Room ... 105 Address only "The Commissioner of Patents.

Voo

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Frank L. Dyer.

e G--0831

...Orange.

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MAILE

New Jersey.

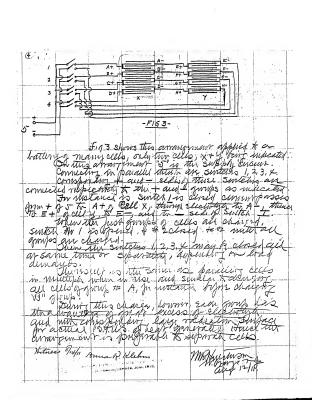
In response to amendment of Jan. 7. 1913.

It does not seem to the examiner that there is such an intimate relation between the method and apparatus claims in this case that they should be permitted to stand in a single application. In this connection applicant's attention is directed to the decision in <u>ex morte</u> McMahon, 48 0. 0., 255. Consequently, division is required between claims 1 to 4, constituting one set, claims 5 to 10 and 15 to 19, constituting another set, and claims 11 to 14, constituting a third set.

Method of Subdividing the Elements of Storage of "Seconday" cell wito broups ment of the tendency of modern Storage Battery Develop-ment and use is toward large cells having a great-menter of potent and negotive Batter of South Especially down two others in Surfacing Book occasined by the great moreas in sign of attack on the gratish and feedless, mer mit in the practicel Such brats as the ance of operation Strage Batteres in Submarine & lies in The resistant madeques relitation of coming there is not sufficient space an according permit of language and all of the Baltin Jawks, show it the relectively laster towards of the insuch Jaws when formers and in Sumarner party design of four to the disapper of Superfor any asmall others as posite manir and get, thouse the prosecuto al min venuation for subscripting the last process of the last proces Bead" or acid straggetto nutry contatumy sees oll placed in sugh orm-Jus, camer a partners, and & relatively to texcupit Junio In this reason Surmanos in trapelly a terror pur Surmanos in trapelly at the final well the grant fathers with Kyent difficient tochaigs Mohaleman

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Con Alexander of 8/31/11.

Mr. Diger, and worm grown

On any 12th & handed over

details of "Metter of Subdivering the climates of a Stringe or Secondary Clil nother Sorupes", for application to be made.

I cannot tro zarnesty urgs expedition of films this case. It is extremely important to use without the metiral it writed to under the writed to improve for my submiring work, because the 18 this cell must be charged at 3 hour rate and we to charged at 3 hour rate and more than confirment of dynamic than confirment of dynamic than consider at high than 6 hour rate. Furtherwars it so impossible through the cell when charged as a whire another when charged as a whire another when charged as a whire another

3 hour rate. By duling the Elements with two graphs D. Elements with two graphs had the practical mouth

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So please show this about of 5 motion the applicaand lets ger the application in. Or is really a servino maller

Mulotusm

Edison Storage Battery Co.

Thomas a Edison.

Orange, N.J., U.S.A.

Mi Sanahan: Occasion may aire when it is disuel, to discharge only one, two or there groups in parallely kuping the fruth gurup In aningury work. On is well know ited the suit of a cell is worm as having of discharge than after or has how in use on ome ting. The speed of the nutur made load theuse the speed of the war expende suform the impressed Em. J. , because the lugar the vollage the more owners will Jane So, in serve ruising they can use only one sem elimines and when speed work is disited, can them this set out and pur in the other the groups in parallel, with enoquino brueps Jun when the Ent of the 3 session quipo file to that of # 1 mide groups your on parallelet. Was all can he parallelet. When this served or now this

Specifications & claims.

Mr. Hutchesin Please look men this sensed specification make such suggestions as to changes as you may think proper Lanaham

Sept. 26, 1911.

Mr. Dyer:-

The attached drawing is a part of an application about to be filed for an invention of Mr. Eutonicon's relating to charging secondary cells and utilizing the current therefrom. Will you kindly sign this drawing. Mr. Eutoniacon has assigned the United States rights in this invention to the Storage Battery Co. and the foreign rights to Mr. Edison. Mr. Hutchison is of the opinion that foreign applications ought to be filed on this invention. Perhaps it would be well to postpone a consideration of this matter until we have received the first Patent Office action.

HL-JS

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Jahren To Sanghan

Jahren To Sanghan

January 18, 1912.

Mr. Dyer:

I hand you herewith an application of Mr. Rutchison's for Charging Secondary Cells and Utilizing the Current Therefrom, Folic 785, assigned to the Edison Storage Eattery Company. The first Office action in this case is a requirement for division, and two references are cited as the result of a cursory examination. The invention is not disclosed in either of these references. Mr. Hutchison recommends that foreign applications be filed on this invention in the following countries: England, France, Germany, Italy, Russia, Japan, Argentine, Brasil and Chile.

Please advice me what you wish done in this matter.

HL-JS

Lanahan

w and redwing

To when

Mr. Dyer .-

I have your memo 2035-A, of February 1, enclosfor charging secondary cells, and utilizing the current therefrom, Folio 785.

This invention is of especial value on submarines and electric locomotives. Repecially does this obtain in submarines, because there we have great difficulty in cooling the cells when charging rapidly. Of necessity, the size of the air intake and outlet pipes for ventilaing and cooling, are small, owing to the difficulty of occluding such a passage, if of considerable diameter, to prevent ingress of water, when submarged:

In this patent, I divide each cell into several groups, and treat each group separately. That is, supposing we have an S-20, consisting of twenty positive plates. This cell would be made up in two groups of ten positives and eleven negatives to each group, having their respective binding posts, but both groups submærged in the same electrolyte. All of No. 1 groups are connected together in series, and all of No. 2 groups are connected together in series. Maturally, when charging at a high rate, or in fact, at normal rate, in Tropical was through the cell, read to the contract of the cell of the cell

The use of lead storage batteries in submarines is attended by much difficulty in cotling, and this incomplication is applicable to lead objection in the incomplete of the submarines which is a constant of the submarines of the submarines in the submarines in the cotline to proviously of submarines in the complete of the submarines in the submarines in

Another interesting feature of this invention is the ability to discharge the cells one group at a time. Supposing a submarine goes out for a practice run. She uses only Mo. I groups, and when the returns, charges that one group up. In the event of unforeseen conditions arising, she has No. 2 group always fully charged. This makes the boat more flexible in manocurering, as are can

. call on a freshly charged group of cells at any time, for forced speed.

In the operation of electric locomotives charging at high rate, we would also divide the cells into two or three groups, thereby facilitating cooling when charging at high rates.

M. R. H.

N. B. I am returning Lanahan's memo herewith.

February 18, 1912.

Mr. Dyer,-

The Submarine Cell patents have not, as yet, been prepared.

We are taking big chances.

I am called upon to furnish detail working drawings to the Wellman-Seaver-Morgan Company, and to the United States Goverhment on this new pontoon orane battery, in which I will use S-6 cells. Construction cannot be started on the batteries until the drawings have been approved by the Navy Department. I do not dare to forward the drawings until the patents have been put into the office, because I have no way of detecmining as to who will see them after they leave our Works.

I also do not think the Foreign patents have been applied for, for this method of dividing the elements of a cell into groups. This is very important, as I am describing this feature to several Foreign Governments. Have to do it. This Submarine Battery matter has been in preparation now for a year and one-half, and I want to see some results come into that Factory.

I trust you will facilitate the patent end as much as possible, and thereby greatly oblige,

Yours sincerely,

nuch were them.

putents ever?

Before expiration

Mr. Dyer:-

In reply to your memo herewith, patents in the following countries will cost as follows:-

Great Britain Navi Nutl. \$50.00 \$670.00 \$6	00 00 00 00 00 00 00
(636)	
In the past we have taken out patents in Jap	pan,
Argentine, Brazil and Chili through Van Oldenneel, and	i I have
taken the cost from his price list, but I find that Ke	arks& Clerk'
(New York) price list is considerably lower. If it	is corroct,
we can have them attend to the filing of the applicat	ions and
save about \$145.00.	
2/21/12 hustweeted by Mr. Dyen to file offers in all of above - overtimed countries, except C	LE THE
برانا ،	
and to take out this fitter, whomen founds	فد, مث
All takes part of July 15-19 1 1912.	

February 21, 1912.

Mr. Hutchison:-

In the matter of your inventions on the submarine cell, Mr. Dyer has instructed me to prepere a single United States application including all of the features of this cell, and to defor the matter of fercian applications on this construction until after the filing of the United States application.

HL-JS

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RECEIVED SEP. 71912 FRANK L. BYER.

October 3, 1912.

Mr. Dyer:-

We have three patents in Japan and one pending application - all on storage batteries.

Folio 87 - Four years to run. Tax will total \$115.00

Folio 88 - " " " " " " " "

Folio 182- Seven " " " " \$185.00

Pending application the one referred to in Van Oldenneel bill.

Folio 726 - Providing no appeal is necessary, this case will cost us before expiration \$245.00 taxes and about \$100.00 for working if the latter is done by advertising. The total, including first cost tax and working, will be about \$468.00.
The above includes Van Oldenmeel's services which are about 100% above schull Patent Office fees.

Argentine Republic

One pending application on Storage Battery (Hutchison oase referred to in Van Oldenneel bill). Ten years - \$185.00.

Lax. for next nine years at \$25.00 per year will be \$225.00.

Total without working \$378.00. The actual government fee for tax is about \$5.00. If we could arrange to pay it ourselves it will bring the total tax down to \$45.00. (Mr. Kennedy is locking into the matter)

Brazil

one pending application on Storage Bettery (Hutchison case referred to in Van Oldenneel bill) Piften years - \$184.50. Taxes will amount to \$675.50 - total \$860.00 Van Oldenneel charge.

F. H. Linn

Jugger.

Sold State of State o

PRESIDENT'S OFFICE

Memorandum

October 7, 1912.

2226

Mr. Lewis:

Referring to the attached memorandum, is Folio

No. 726 the Hutchison patent in Japan? Also advise me if

there are any patents on the battery in Argentine on which

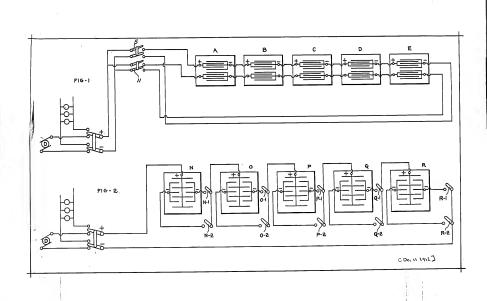
) one taxes are payable.

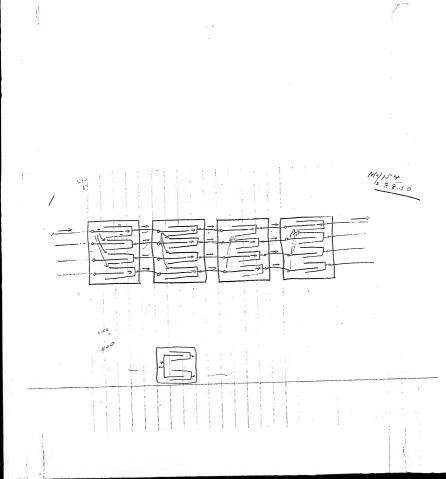
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one side is being charged, there will be a leakage in each all I ran a test ou 2 of the 3 from the side being changed to C-122 cells which assembled some the idle side. The result of Time ago, The third one showed this would be that the current in no cafeacity after sharge and when the idle side would increase out ofer the cover was found to from the ends of the series toward the center and in the same way be see wrong, as soon as the , 3ª call is formed & will run a test the charging current in the side on the whole three Being charged would decrease from buille the two cells & found the end allo toward the center of the series of cells. If there were that ouchonging one half at 90-100 amps, the current through the enough cells in the series, the other-half was 4.5-3 amps. decreasing currents thru the idle and very relowly on the charge progressed changing sides would be equal at the middle of the series + -11-90A+11-Resp. Currenton I believe that if for example

M.Lanahan

re applications for Catrices on " Secondaus Cilla Ochanging Same Than explained the importations Her him I desire to withdraw the applications, and have orgunsted that De allowed to pay for the cists on same todate, as for mus #738.93 propard by m milker HE has assented will you therefore take 5/2/20 to "can this at once File wroppers nturned harmen.

Fobruary 22, 1913

Miss Laidlaw: -

FOLIO 785 - HUTCHISON

Although this application is to be dropped, please keep it in the pending files until it becomes abandoned, inasmuch as it may be of interest in connection with the application on submarine cells to be filed in Er. Hutchison's name.

H. L.

THE.

Patent Series Patent Application Files

Folio # 794 Kinetoscope

U.S. Patent #: 1204424

Primary Applicant: Gall, Adolph F

Date Executed: 10/9/1911

SEP 11 191

I send you herewith the papers Folio 794 relating to the Home P. K.

The claims which were allowed in this application cover only the film shifting and feeding mechanism shown in Figs. 6 and 11 to 15 of the drawings in the application.

The following four sets of claims, each set relating to a different feature of the machine, were canceled from the original specification in compliance with a requirement for ivision by the Patent Office:-

- 1. Original claims 19 to 22 covering the means for tensioning and holding the film flat while passing projecting position, which means is shown in Figs. 9, 11, 20 and 21 of the drawings in the application.
- 2. Original claims 24 to 27 inclusive covering the film winding means, which means is shown in Figs. 7, 8, 18 and 19 of the drawings in the application.
- 3. Original claims 38 and 39 covering the lens mounting or Alking device, which is shown in Figs. 3 and 4 of the drawings of the application and which comprises the parts numbered 38. 39. 77, 78, 79 and 88.

4. Claims 40 to 42 inclusive covering the lamp house mounting, which is shown in Figs. 2, 16 and 17 of the drawings of the application.

There are two questions to be decided: First, do you consider the invention covered by the allowed claims of the present application of sufficient importance to warrant taking out the patent? This will involve a payment of \$20.00 for the final Government fee. Second, do you wish a divisional application or applications filed on the subject matter covered by any of the four sets of claims enumerated above. In connection with the latter question, your attention is directed to the fact that should you decide that it is advisable to file a divisional application or applications, the same must be filled before the payment of the final fee on the allowed application, which fee is due October 17, 1916,

Please advise.

WH-JS

William a. Hardy

Patent Series Patent Application Files

Folio # 801 Cer

Cement Kilns

Serial #:

655902

Primary Applicant: Edison, Thomas A

Date Executed: 10/16/1911

Applicant.		Addre	SS
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FRANK L. DYER,

Counsel,

Orange, New Jersey.

Petition.

To the Commissioner of Patents:

2. d

Pour Petitioner THOMAS A. EDISON
a citizen of the United States, residing and having a Post Office address at
Llowellyn Park, West Orango, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

CEMEUT KILDS

set forth in the annexed specification; and he hereby appoints Frank L. Wyer (Registration Lo. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thomas A Edium

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, Resax County, New Jersey, have invented certain new and useful improvements of CHEMENT KIINS, of which the following is a specification:-

My invention relates to cement kilns of the rotary type and hae for its objects methods and means for improving and rendering more economical the operation of such kilns. Hitherto it has been the practice to make use of easily combustible materials, such as gas, oil, or bituminous coal, as fuel for heating such kilne. The fuel ie projected into the lower end of the kiln usually by means of an air blact and ignited. When fuele of thie character are used for this purpose, complete combustion takee place very rapidly, and the high temperature flame produced thereby extends only a limited dietance into the kiln. As a result, the length of the clinkering zone is limited and trouble is experienced due to the formation of chalk rings or accumulations of raw material where the raw material entere the clinkering zone. By employing more difficultly combuetible materials, or a mixture of more easily and more difficultly combustible materials, the heat in the kiln is extended over the entire area, and ie eomewhat reduced in intensity, and the clinkering zone is

considerably lengthened. I have found that these advantageous results may be obtained by using a mixture of pulverized anthracite and bituminous coals. When such a mixture is used, the bituminous coal ignites almost immediately upon entering the kiln and supplies sufficient heat to ignite the anthracite coal, which burns further up the kiln, forming a long continuous flame of high temperature, and the troubles due to chalk rings hitherto experienced are materially reduced. The clinkering zone is considerably lengthened, and its outline is less sharply defined than when using bituminous coal straight, and greater economy of operation is secured. For example, it has been found that by employing a mixture of 35% anthracite and 65% bituminous, about 10% more clinker may be burned with the same amount of coal than when using bituminous coal alone. Furthermore, by my invention, the lower and cheaper grades of anthracite coal may be utilized, and a considerable saving of expense thus effected. When using a mixture of anthracite and bituminous coals, I have found it desirable to employ an auxiliary oil burner in order to start the kiln and raise it to a clinkering temperature. Where a very large percentage of pulverized anthracite coal is mixed with a small percentage of bituminous coal, as for example, a mixture of 75% anthracite and 25% bituminous, the auxiliary oil burner is necessary not only when starting the kiln, but also in case the heat bocomes reduced due to a stoppage or to variations in the operation of the kiln. My invention consists also in the provision of means for spreading the mixture of pulverized coal and air as it is projected into the kiln, so as to break up the column of coal and air in such a manner that the heat of the kiln can come into intimate contact with it

and cause the ignition of the pulverized coal to take place more readily. Wy improved spreading device ie adjustable so that a greater or less distribution of the pulverized coal can be obtained, as is found necessary or desirable, thus changing the location of the heat in the kiln.

In order that my invention may be more readily understood, reference is had to the drawings accompanying and forming part of this specification, and in which -

Figure 1 is a side elevation partly in section showing a rotary kiln provided with fuel feeding apparatus squipped with my improved spreading dovice:

Figures 2 and 3 are side and plan viows respectively of my improved spreading device applied to the end of a fuel supply tube or pipe;

Figure 4 is a side elevation partly in section showing a rotary kiln provided with fuel feeding apparatus and with an auxiliary oil burner; and

Figure 5 is a sectional view on the line 5-5 of Figure 4.

Referring to the drawings and particularly to Figures 1, 2 and 3 thereof, the lower of a rotary kiln is shown at 1 opening into a charber 2 which is provided with a chute 3 for directing the clinkered material into a cocling cylinder 4. The charber 2 is provided with an opening 5 opposite the end of the rotary kiln. Through the opening 5 is extended the end of a fuel supply pipe 6. The fuel supply pipe 6 to supplied through a pipe 7 from a hopper 9 with pulverized fuel, preferably a mixture of pulverized anthracite and bituminous coals, and is supplied with air under pressure through a pipe 9 which is connected to any suitable means for supplying the com-

pressed air. The pipe 7 is provided with a valve 10, and the pipe 9 with a valve 11 for controlling the supply of pulverized fuel and air. Any other suitable meane may be employed for thie purpose. The end of the fuel supply pipe $\underline{6}$ which extende into the chamber $\underline{2}$ is provided with a device 12 for epreading the fuel which is projected from the pipe 6. The fuel epreading device 12 is illustrated more in detail in rigures 2 and 3 and includes a eleeve 13 adjustably mounted upon the pips 6. The elseve 13 has projections or extensions 14 and 15 extending parallel to the pipe 6 and beyond the end thereof. Supported by the projections $\underline{14}$ and $\underline{15}$ ie a cone-chaped portion $\underline{16}$ having its apex turned toward the opening in the end of the pipe 6 and located substantially in the line of the axie of the said pipe. The fuel spreading device 12 may be adjusted by moving the sleeve 13 slong the pipe 6 so ae to vary the dietance between the cone-shaped portion and the end of the pipe and thereby control the distribution of the pulverized fuel which is projected from the fuel supply pipe $\underline{6}$.

In Figures 4 and 5 of the drawings, I have illustrated a comswhat modified form of fuel zeeding apparatus of which an auxiliary oil burner forms a part. In this modification two fuel feeding pipes 21 and 22 are provided, having their ends extending into the chamber 2 through the opening 5. Each of these pipes is preferably provided with a fuel spreading dovice 12 similar to that illustrated in Pigures 1, 2 and 3. The hopper 8 is provided with two connecting pipes 23 and 24 for supplying pulverized fuel to the fuel supply pipes 21 and 22 respectively. Air is supplied to the pipes 21 and 22 from any convenient source through the pipe 2. Valves 11 may be provided in the

pipes 21 and 22 and valves 10 in the pipes 23 and 24 for controlling the supply of pulverized fuel and air. An auxiliary oil burner 25, which may be conveniently located between the two pipes 21 and 22 is provided for starting the kiln and raising it to a clinkering heat, and also in case the heat becomes reduced, due to stoppage or variations in the operation of the kiln. The oil burner 25 is supplied with oil from any convenient source through the pipe 26 and the connection 27. The oil burner may be supplied with air through the pipe 9 and the flexible connection 28. A valve 29 is provided for controlling the oil supply and a valve $\underline{30}$ for controlling the supply of air to the oil burner. The oil burner 25 ie detachably connected to the connection $\underline{27}$ and the connection $\underline{28}$ ie made of flexible material in order to enable the oil burner to be removed from the opening $\underline{5}$ after the kiln has been etarted or when not otherwise needed.

Having now described my invention, what I claim and desire to protect by Letters Patent of the United States ie as follows:-

- 1. A method or heating a rotary cement kiln, which consists in projecting into the kiln a pulverised mixture of easily and difficultly combustible fuels, and igniting the same, substantially as set forth.
- A method of heating a rotary owner kilm, which consists in projecting into the kilm a mixture of finely divided enthrecite and bituminous coals, end igniting the same, substantially as set forth.
 - 3. A method of heating a rotary cement kiln, which

consists in projecting into the lower end of the kiln a stream componed of a mixture of air and pulverized easily and difficultly combustable fuels, and igniting the same, substantially as set forth.

- 4. A method of heating a rotary coment kiin, which consists in projecting into the lower end of the kiln a stream composed of a mixture of air and anthracite and bituminous coals, and igniting the same, substantially as set forth.
- A method of heating a rotary coment kilu, which consists in projecting into the lower and of the kiln pulverized fuel, and spreading and igniting the same, substantially as set forth.
- 6. A method of heating a rotary dement kiln, which consists in projecting into the lower end of the kiln a pulverised mixture of easily and difficultly combustible fuels, and in spreading and igniting the same, substantially as set forth.
- 7. A method of heating a rotary coment kiln, which consists in projecting into the lower end of the kiln's mixture of pulverized anthracite and bituminous coals, and spreading and igniting the same, substantially as set forth.
- e. In coment burning apparatus, the combination with a rotary kiln, of means for supplying pulverized fuel to the same, the said fuel supplying means being provided with means for spreading the fuel, substantially as described.

9. In cement burning apparatus, the combination with a rotary kiln, of meane for cupplying pulverized fuel to the same, the said fuel supplying means being provided with adjustable means for epreading the fuel, cubstantially as described.

10. Means for aupplying pulverized fuel to a rotary cement kiln, including a fuel supply pipe and a fuel spreading device mounted thereon, substantially as described.

11. Heans for supplying pulverized fuel to a rotary coment kiln, including a fuel supply pipe and a fuel spreading device adjustably mounted thereon, substantially as described.

12. Heans for supplying pulverized fuel to a rotary comont kiln, including a fuel supply pipe and a fuel spreading device mounted in operative relation to the end of the said pipe, and having a tapered portion adjustable to and from the opening of the said pipe, substantially as described.

13. In coment burning apparatus, the combination with a rotary kiln, of means for heating the same, comprising means for projecting pulverized fuel into the kiln, and an auxiliary heating means, substantially as described.

14. In cement burning apparatus, the combination with a rotary kiln, of means for heating the same, comprising means for projecting pulverized fuel into the kiln, and an oil burner, substantially as described.

16. In cement burning apparatus, the combination with a rotary kiln, of means for heating the same, comprising means for projecting pulverized fuel into the kiln

and epreading the same, and an auxiliary heating means, substantially as described.

- 16. In cement burning apparatue, the combination with a rotary kiln, of means for heating the eams, comprising adjustable means for projecting pulverized fuel into the kiln and spreading the same, and an auxiliary heating means, substantially as described.
- 17. In osment burning apparatus, the occibination with a rotary kiln, of means for heating the same, comprising means for projecting pulverized fuel into the kiln and epreading the same, and an oil burner, substantially as described.
- 16. In oesent burning apparatus, the combination with a rotary kiln, of means for heating the ease, comprising adjustable means for projecting pulverized fuel into the kiln and epreading the same, and an oil burner, substantially as described.
- 12.
 19. In cement burning appearatus, the combination with a rotary kiln, of means for heating the same, comprising means for projecting pulverized fuel into the kiln and means for epreading the same, said means being independently adjustable, substantially as described.

This specification signed and witnessed this 16th day oflectaber 1911

Thos A Edison

Witnesseth:

1. Hury Lanahand 2. Anna P. Keehin

Oath.

State of New Jersey \ ss., County of Essex

, the above named THOMAS A. MPISON , the avove names petitioner, being duly sworn, deposes and says that he is a citizen of the Cluited States, and a resident of Llewellyn Park, West Orange, Essex County

New Jersey

that he verily believes himself to be the original, first and sole inventor of the inwrobentents in

OWNER KILIS

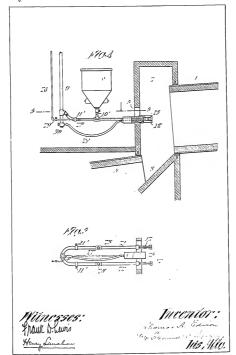
described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 16th day of lectrum 191!

Boma P. Klehr Dotary Bublic.

[Seal]

650.902 804 1.70.1 190.5 1711.5 Inventor: hours A. Edward Was Hilly Mensey: Spaul D. Lewis Henry Lanalan



19 236
Div. Room

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Paper No. 2 REJ.

All communications respecting this
plication should give the sectal number,
date of dillog and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Hov. 25, 1911

26, 1911 PATENT

Thomas A. Edison,

Care Frank L. Dyer,

Orange, N. J.

Please find below a communication from the EXAMINER in charge of your application.

for Coment Kilns, filed Oct. 21, 1911, Serial No. 655,902.

SBM15075/

The claims in this case cover two distinct inventions and division is accordingly required.

Claims 1 to 7, inclusive, cover a method for burning pulverized fuel and the remaining claims cover a fuel feeding apparatus. The following putents are ofted:

Carpenter 691,336, Jan. 14, 1902, Class 110-41; 2611, 942,696, Dec. 7, 1909, Class 110-104; Bassler, 300,127, ug. 3, 1909, "geaver, 738,131, bep. 1, 1903,"

Carpenter 691, 336 charles me 7 mysters
of pulsaryid authorite and bottomings coul of adjustable spreader. Barsler 930, 127 almo adjustable Opinder X Zell 942, 696 shows adjustable spender_ Lunhard 969, 169 - phones combined gas and pullwaryed fred hearter.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

CEMENT KILMS Filed October 21, 1911

Room No. 236 ...

Serial No. 655,902

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of November 25th, 1911, please amend the above entitled case as follows:-

Cancel claims 1 to 7 inclusive and renumber the remaining claims as 1 to 12 inclusive.

REMARKS

Olsims 1 to 7 have been canceled in response to the requirement of division. Applicant reserves the right to file a divisional application covering the subject matter of the canceled claims.

Action on the merits of the claims now in the case is requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank C. Slyer

Orange, New Jersey November 22, 1912 Div. 19. Room236

Address only
"The Commissioner of Petests,
Weshington, D. C."

___JÅ_260

Paper No.....4 REJ
All communications respecting this
plication should give the serial numb
date of filling, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON December 17, 1912.

Thomas A. Edison,

a 6-4633

Care Frank L. Dyer,

Orange, N. J.

DEC 17 POR DEC 1- 1912

Please find below a communication from the EXAMINER in charge of your application.

for Gement Kilne, filed Oct. 21, 1911, Berial No. 655,902.

&BMsort!

Commiss

This case has been considered as amended November 23,

Since the part 1 is referred to as a rotary kiln some means should be shown for rotating the same.

Claime 1-6 inclusive, 8, 9 and 12 are rejected on the art of record, particularly Zell.

of rocord, particularly Zell.

Claims 7, 10 and 11 are rejected in view of either

Linhard, 969,169, Sept. 6, 1910,Clase 110-104; or Schutz, 836,146, Nov. 20, 1906, " 110-28.

See aleo

larcen, 824,788, July 3, 1906,01asc 110-104; Chapman, 329,727, Nov.3, 1888, 158-118; Mangeledorff,97,113,16v. 22,1910, 10-104; Wilson et al.,438,872,0ct. 21,1890, 110-22; Leede, 292,236, Jan. 22, 184, 110-22; Allomas a. Edison

The Edison Portland Cement

I have a letter from the Legal Department asking for information in regard to the Spreader Gun, burning oil in the Kiln, &c., and the following are present conditions. I thought you might be able to describe to the Legal Department the type of patent which would be most advantageous.

After reading this, will you please turn it over to the Legal Department with such comments as seem to you necessary.

In burning anthracite coal mixed with gas coal we have found that with a mixture of 35% anthracite and 65% bituminous, we are able to burn about 10% more clinker with the same amount of coal than we could when using the gas coal straight. We attribute this to the fact that the heat in the kiln is extended over a longer area and is somewhat less in intensity than with the gas coal straight, due to the fact that the gas coal ignites almost immediately upon entering the kiln and supplies sufficient heat to ignite the anthracite, which burns further up the kiln making a long continuous flame of high temperature. By this means we have discovered that there is very much lees trouble from ohalk rings or accumulations of raw material partially cindored as the raw material enters the clinkering zone, and the clinker zone is considerably lengthened and its cutline lees charply defined than when using see coal ctraight.

When using this mixture of anthracite and gas coal, it is desirable to have an auxiliary oil burner in order to start the kiln and get it into a clinkering heat, as the mixture burne very slowly when the kiln is cold, and it is very difficult to get the heat without the addition of oil.

When burning a larger percentage of pulverised anthracite with bituminous, say 75% anthracite and 25% bituminous or gas, the auxilliary oil burner is necessary, not only when starting the kilm, but also in case the heat becomes reduced due to stoppage of the kilm or variations in the operations.

It has also been found desirable and necessary with a higher percentage of anthracite, eay from 50% up, to use a Spreader on the pipe injecting the mixture of pulverized coal and air into the kilm. This Spreader breaks up the column of coal and air so that the heat of the kilm can come into intimate contact with it and cause the ignition of the pulverized coal more rapidly.

Sketch of thie Spreader is enclosed, and by adjusting the Spreader closer or further from the end of the pipe, greater

Mr. Edison.

-3-

7-24-11.

or less distribution of the pulverised coal can be obtained, as is found necessary or desirable, thus changing the location of the heat in the kiln.

So far our best results have been obtained by burning a mixture of 35% anthracite and 65% gas coal.

By this means we can utilize the lower and cheaper grades of anthracite coal, and this effects considerable saving. It would seem if we could pulverize anthracite sufficiently fine, we would be able to burn it straight without any gas coal. Yours very truly,

WHMasy

WHM-RR.

Eno. 1.

Really Lewis Tota 191. telephones to concer plan for more data 1/20 191.

Norther 2' PIPE Morable

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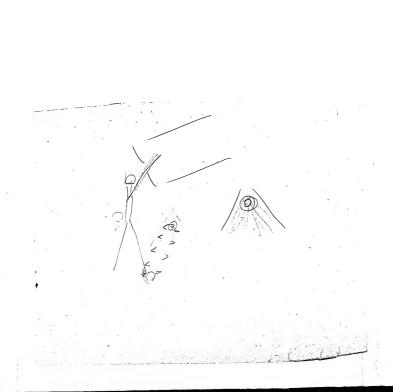
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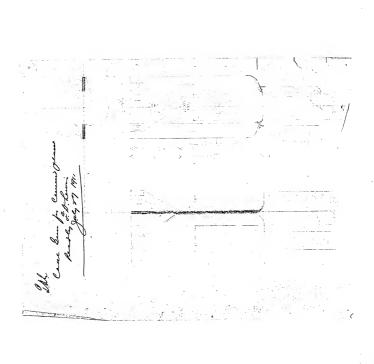
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7-29-11





FORM 47

Thomas a Edison

The Edison Portland Cement Co.

THOMAS A. HOGGO, CHARTMAN OF BOA! W. S. Mallocky, President J. Linton Thomison, Vice-President

Telegraph, Freight and Passenger Station, NEW VILLAGE, N. J. PHILAGE, N. J. PRILAGE

P. O. ADDRESS. STEWARTSVILLE, N. J.

July 24, 1911.

Legal Department,

Edison Laboratory,

Orange, E. J.

Mr. Frank D. Lewis.

Dear Sir:

Your letter of the 21st inst. to Mr. Mallory has been referred to me. I beg to advise that I have written to Mr. Edison giving him facts and a eketch of this Gun.

I do not just know what he wants to cover in this patent, and I thought it best to give him the opportunity to go over my letter and forward it to you with his comments.

Horize this is satisfactory, I am

Yours very truly,

WHomasy

WHM-RR.

P

Patent Series

Patent Application Files

Folio # 806 Method of Forming Sound-Record Molds

U.S. Patent #: 1097985

Primary Applicant: Moore, Sherwood T

Date Executed: 11/29/1911

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L. nov. 22, 1911

L. nov. - 1, 1911. Deterl securing the the backing Cey occasion - Marie - Marie - Works Mr Edit ma ackenie is showing rate some change 1st the tacker is provided with flange as alum and the of preder is ful in the Emereline channel this fluing prevent the # matrix from y Do you see any we in putting in a brew Wille ? this much be like the enget in his notingualde Broken ich also sugget claning a record that is a fig like the. drawing let me know if anything for made coned by alum

Patent Series Patent Application Files

Folio # 813 Alternating-Current Rectifier

U.S. Patent #: 1221981

Primary Applicant: Edison, Thomas A

Date Executed: 12/12/1911

Soptember 29, 1916

Attended of thomas A. Edison for Alternating Current Rottiflero, filed Déc-éo, 1911, Sorial No. 668, 611

Mr. Edieon:-

Claims 6 to 11 inclusive of this application are under final rejection. The invention covered by these claims is the use of a carbon contact on the armature in a rectifier. The finally rejected claims read as follows:-

6. In an alternating ourrent rectifier, an elongated armature of magnetic material provided with a carbon contact, substantially as described.

 In an alternating ourrent rectifier, an armsture, a carbon contact carried thereby, and means for vibrating the armsture in symbronism with the current to be rectified, substantially as described.

 In an alternating current rectifier, an elongated soft iron armature pivotally mounted at one end thereof and provided with a carbon contact member at the other end, subtantially as described.

 In an alternating ourrent rectifier, a stationary contact member having a large contact surface, and a plurality of carbon contacts adapted to co-operate therewith by movement into and out of contact therewith, embetantially as described.

10. In an alternating current rectifier, the combination of a carbon contact, and means for vibrating the same in eynchronism with the alternating current to be rectified, substantially as described.

11. In an alternating current restifier, a stationary contact member and a contact member assigned to co-operate theoretic hand to be more and count of opporative relation theoretic in symbol with the alternating current to be read out of contact to be a contact of call contact being of carbon, substantially a described.

The references upon which the claims are rejected are British patent 12508 of 1901 and U.S. patent to Russell 755,048. The British patent shows a rectifier of substantially the same type as the rectifier shown in this application. See particularly Fig. 2 of the British patent. In the patent to Russell, an elongated conducting member 6 is pivotally mounted at one and and carries a carbon pencil serving as a contact at the other end, adapted to contact electrically with two fixed contacts 12 and 13. Means is provided for escillating the elongated member from one contact position to the other. The particular use of the Russell device is for establishing circuit connections alternately through lamps used in an advertising device.

The Examiner's position is substantially that there is no invention in providing the vibratory member d shown in Fig. 2 of the British patent with a carbon contact such as is used in the Russell patent. The Examiner state

"The British patent 12,508 of 1901 discloses and "The British patent 12,508 of 1901 discloses and "The British patent 19 yearhonously driven and "The British patent 1901 and 1901 and

We believe that the Examiner's position is correct and that the claims are not patentable.

Will you kindly advise me whether you wish to take an

appeal from this rejection to the Board of Examiners-in-Chief, or whether you are willing to have us cancel these rejected claims.

Henry Lanahan

HL-JS

FFF F

Patent Series

Patent Application Files

Folio # 810 Method for Producing Tablets for Sound-Records

U.S. Patent #: 1146413

Primary Applicant: Edison, Thomas A

Date Executed: 12/19/1911

Julcul filling the . Clark before pressure by way Kulbar 7

Patent Series

Patent Application Files

Folio # 812 Production of Finely-Divided Metals

U.S. Patent #: 1275232

Primary Applicant: Edison, Thomas A

Date Executed: 12/20/1911

Received from Mr. Edwar - Nov 22, 1911

Method of preparing extremely friely divided metals which over mon pyrophoric -

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pre I water. We Edward have from that the
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any he her dere he have gly wat phone by from
Many though it and deplacing the by days.
The method ground he applied to how, him is beard,
this offers colable, columns, tungeton,
world belower and other matthe where opening
can be reclined by by deapy.

Eu Edward 727.117

Proposed New Claims in Application of Thomas &. Edison, Serial Bo. 667,366, filed December 22, 1911, entitled Broduction of Finely Divided Metals

- 12. A new composition of matter constitute of electrolytically active iron reduced in finely divided condition and rendered non-pyrophoric without change in its physical structure, substantially as described.
- 13. A new composition of matter consisting of electrolytically active iron reduced in finely divided condition and rendered non-pyrophoric without change in its physical structure or its chemical properties, substantially as described.
- 14. A new composition of matter consisting of electrolytically active from reduced in finely divided condition and rendered non-pyrophoric without substantial change.

in its porosity, substantially as described.

December 22, 1914 Are in not only four from hydrocales and hydrottes but also from from from anies. I he open to log -13 - though the lines be removed ?

your application for the production of non-pyrophoric

d Tron, the following claim has been allowed:-11. A new composition of matter consisting of

non-pyrophoric finely divided iron free from (hydrates or hydroxides), substantially as described. organ compiuminos

Ball

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All of the other claims are under rejection. The principal reference is the patent to Kayser No. 1,001,279, in which non-pyrophoric finely divided nickel is produced by reducing a nickel compound with hydrogen at a high temperature and thereafter displacing the hydrogen with carbonic acid gas. In your invention, iron is treated in a similar way but the hydrogen is displaced by nitro-Furthermore, in your invention the reduced mass is permitted to cool before the hydrogen is displaced by nitrogen, whereas in Kayser the reduced mass is maintained at a high temperature while the hydrogen is being driven out by the carbonic acid gas.

It will aid me in the further prosecution of your application if you will give me information on the following points:-

In your application it is stated that the hydrogen may be displaced by passing nitrogen or some other suitable inert gas through the reduced mass. Is carbonic acid gas a suitable inert gas for this purpose?

What advantage is there in using nitrogen instead of carbonic acid gas in treating iron?

What advantage is there in permitting the reduced mass of iron to cool before displacing the hydrogen by the nitrogen?

There are at present claims in the case which are not limited to iron as the metal treated and not limited to the use of nitrogen as a gas for displacing the hydrogen. In view of the Kayser patent, the claims should probably be so limited. Do you think we should endeavor to secure the allowance of a claim such as claim 12, which differs from claim 11 by reciting that the iron is electrolytically active, or world new iron of the character described in claim 11, that is to say, non-pyrophoric finely divided and free from hydrates or hydroxides be electrolytically active?

gotive?\
HI-JS

ION BACK OF PREVIOUS DOCUMENT]

Chemine Theronous of Iron Smolly

- 1

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Wote January 13, 1915

Mr. Edison:-

Kindly advise me whether the attached proposed amendment and argument in your application for the preparation of nonpyrophoric iron meets with your approval. I have talked with Mr. Avlsworth about this application and have also consulted Bell's Book on Iron Smelting recommended by you. According to Bell, see page 94, carbon dioxide has substantially no effect on nickel at the temperature of melting zino, that is to say, about 417° C. At a low red heat there would be a slight exidation and at a bright red heat coneiderable oxidation. Apparently, in the process of the Kayser there would be some oxidation, but of this Claim 8 covering non-pyrophorio finely divided I am not sure. iron free from hydrates or hydroxides has been allowed, and in accordance with your suggestion a claim is now presented covering non-pyrophoric finely divided iron free from oxygen compounds. The other claims for which allowance is now asked are method claims, the broadest of which are 1 and 2, claim 1 relating to reducing any metal from a suitable compound by hydrogen and displacing the hydrogen by nitrogen, and claim 2 relating to reducing iron by hydrogen and dieplacing the hydrogen by any inert gas.

I would not trouble you about this matter if it were not for the obscure nature of the phenomena involved in your invention and in the references cited.

Henry Canahan

Ht.-JS

This sheet was rewritten be fine flowing ,

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison PRODUCTION OF FIRELY DIVIDED METALS Filed December 22, 1911.

Room No. 175

Serial No. 667,366

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of Junuary 26, 1914, please amond the above entitled case as follows:-

Page 3, line 10, before "free" insert - not only free from oxides but is also - .

Oancel claims 1, 2 and 3 and renumber claims 4 to
10 inclusive as 1 to 7 inclusive.

Ranumber claim 11 as 8 and rewrite the same as

follows:-

 i new composition of matter consisting of non-pyrophorio finely-divided iron free from hydrates or hydroxides, substantially as described.

Cancel claim 12.

Add the following claim: -

 A new composition of matter consisting of non-pyrophoric finely-divided iron free from oxygen <u>com-</u> pounds, substantially as described. -

Using not say dress from Oxygen.

!

Mr Harry Legal Date

Mr. Edison:-

HE AMENENET OF FOLIO BIE andy lical

In your application for the properties of grant finely divided iron, claims 1 to 7 inclusive, downtributed properties.

This application contains the following claims fovering the product resulting from the process described in the symblotic tion:-

- e. A new composition of matter consisting of non-pyrophoric electrolytically-active iron reduced in finely divided condition and free from hydrates or hydroxides, substantially as described.
- 9. | Non-pyrophorio slectrolytically-active iron, reduced in finely divided condition and having its particles from Doygen compounds of iron, substantially as described.)
- 10/ Finely divided iron reduced by hydrogen from a finely divided compound or compounds of iron and rendered non-pyrophoric by displacement of the hydrogen from the reduced mass by an inert gas, substantially as described.

able that the same physical and electro-chemical properties as non-pyrophoto in the delectro-chemical properties as non-pyrophoto by a subject of the same physical pride in produced by the same physical produced by the same physical produced the same physical phys

All the above product claims stand rejected on the disclosure in lines 12 to 21 inclusive, page 31 of a work by Roscoe thing.

and Solorlemmer entitled "A Treatiss on Chemistry", reading as follows:

"In order to obtain chemically pure iron the oxide, or oxalate, may be hested in a current of hydrogen at the lowest possible temperature; the metal is obtained by this process as a black powder, which oxidizes and becomes incandescent in the air, but if the reduction be carried on at a higher temperature, the powdered iron is non-pyrophorio."

The process of obtaining the non-pyrophoric iron as described in your application is as follows: Finely divided oxide of iron, for example, ferric oxide, is subjected to the reducing action of hydrogen at a suitable high temporature, for example, say 1000 or 1800 degrees F. After the reduction, the reduced mass is allowed to cool slowly in an atmosphere of hydrogen to normal temporature after which a current of nitrogen or other inert gas is passed through the reduced mass so as to displace the hydrogen, care being taken to prevent the access of air or oxygen to the reduced mass.

Will you kindly advise me whether the non-pyrophoric finely divided iron produced by the method disclosed in your application is different physically, electrochemically, or otherwise from the iron produced in the manner described in the matter quoted above from the work of Roscos and Schorlemmer. A print of page 31 of the work of Roscos and Schorlemmer is attacked hereto.

WH-JS

William a. Hardy.

Segul Lound to appeal = once before y

Applained all this to you the difference

Come to use of a will expected

Mr. Baison: Explosion 51 - 1 (human y 15, 1918

Mr. Baison: Explosion 51 - 1 (human y 15, 1918

Jamesdaile you herewith our copy of the above applianted in Sorial 80, 667, 366, 211ad pecemberges, 1011, entitled

Production of Theoly Prised Matelan

This application relates particularly to the production of non-pyrophoric finely divided iron, and contains seven claims covering the process which have been allowed.

The application also contains the following claims covering the product:-

- A new composition of matter consisting of non-pyrophoric electrolytically-active from reduced in finely divided highly porous condition and free from hydrates or hydroxides, substantially as described.
- 9. Non-pyrophoric electrolytically-active iron, reduced in finely divided highly porous condition and having its particles free from oxygen compounds of iron, substantially as described.
- by hydrogon from a finely divided highly porous iron reduced from an tendered non-pyrophorio by displacement of the hydrogen from the reduced mass by an inert gas, substantially as described.

iron having substantial me should divided highly porous chemical profits and alcotronical profits reducing the same sprainal and electronical profits reducing iron by hydrogen from a suitable compound or compounds and then displacing the hydrogen profits reducing the base and the substantially as described.

All of the above <u>product claims stand finally rejected</u> on the disclosure in lines 16 to 21 inclusive, page 31 of the work by Roscoe and Schorlemmer entitled "A Treatise on Chemistry", these lines reading as follows:-

"In order to obtain chemically pure iron, the oxide or oxalate may be heated in a current of hydrogen at the lowest possible temperature; the metal is obtained by this process as a black powder, which oxidizes and becomes incandescent in the sir, but if the reduction be carried on at a higher temperature the powdered iron is not pyrophoric."

The above claims for the product also stand rejected on the ground that they attempt to cover the product by process steps.

Kindly advise whether you wish an appeal taken from the action of the Examiner in finally rejecting these product claims.

In case you wish such an appeal taken, I would appreciate it if you would indicate wherein the non-pyrophoric iron produced as described in the application differs from the non-pyrophoric from produced in accordance with the description contained in the work "A Treatise on Chemistry" referred to above. It would also be of assistance to me if you would authorize Mr. John Miller or some one else of the Chemical Works to disclose to me exactly how the iron used in the storage batteries is made.

A print of page 31 of the work of Roscoe and Schorlemmer referred to is attached hereto.

W.m. a. Hardy.

d much love for the damar co. dels

Mr. Edison:-

I expect to be in Washington on the 30th of this month to attend a hearing before the Commissioner of Ratents. Accordingly, if it is possible for you to see the Examiner with reference to your application relating to the production of non-pyrophorio iron referred to in the attached mesorandum, at any time between one and four thirty P.M. on that date, I will make proper arrangements for a conference.

WH-JS

and have been the control of the state of th

amex, oalington, D.C. Orrive Workington min-fiften trught. Will Indeavor to see you tobight to arrange for conformer with Examina tour warming on non-pyrophoric win application.

EDISON STORAGE BATTERY CO.

ORANGE, N.J.

EDISON CHEMICAL WORKS DIVISION

SILVER LAKE, N.J. Jan. 28, 1918.

Mr. Hardy, Legal Department. Edison Storage Battery Co., orange, N. J.

Dear Mr. Hardy;

We are submitting you two samples of Experiments made up in the following manner;

Experiment No. 3009. Took 100 gms of regular red iron and reduced

at a temperature of 1100 or. Time for reduction - 1 1/2 hours. Both inlet and out-let valves on the pot were closed and the pot was connected to Hydrogen line and cooled to room tomporature. Time - 14 hours. and outside of room comporature. These - 1s hours, Both valves were again closed and the pot was connected to lime supplying Mitrogen. This was done to displace the lydrogen. But of purious the manufacture and the set of purious descriptions composed of sulfurice acid, Ferrous set of purious acid, Ferrous set of purious acid.

Sulphate and Alkaline solution of Pyrogallio acid.
Mitrogen was passed through pot for 1 1/2 hours.
The pot was then opened, the iron was a good
gray color. all reduced, soft and crushed easily

under finger pressure.

Experiment No. 3010. Took 100 gms of regular red iron and reduced

at a temperature of 1600°F. Time for reduction - 1 1/2 hours. Both inlet and outlet valves on the pot were closed and the pot was then connected to Hydrogen line and cooled to room temp. Time - 2 hours. The pot was then opened and the irro was hard and slightly oxidized, and combined in one lump, and would not break up under finger pressure.

CFH_G.

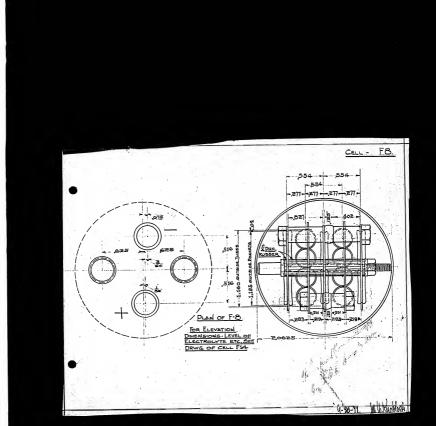
Patent Series Patent Application Files

Folio # 818 Storage Battery

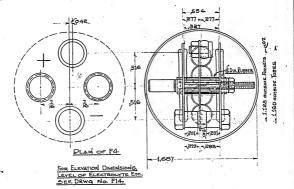
U.S. Patent #: 1073107

Primary Applicant: Edison, Thomas A

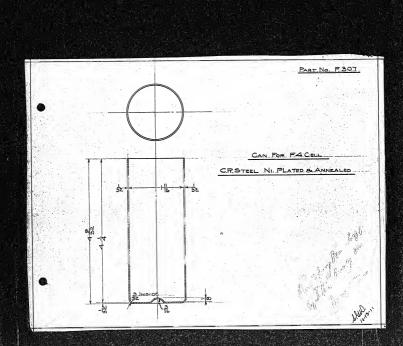
Date Executed: 12/30/1911



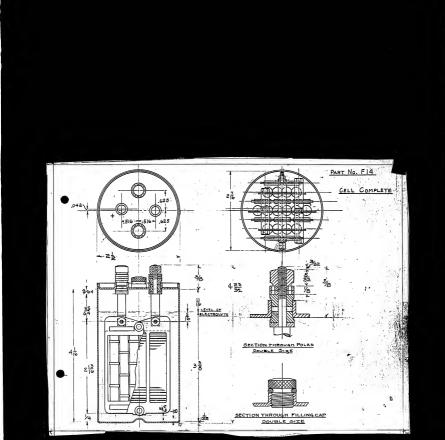
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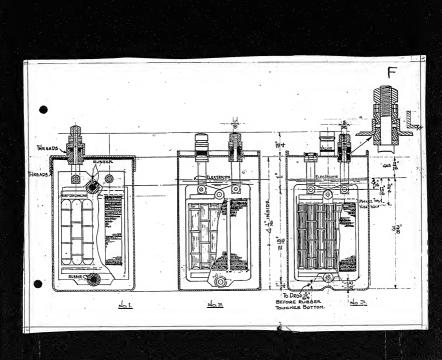


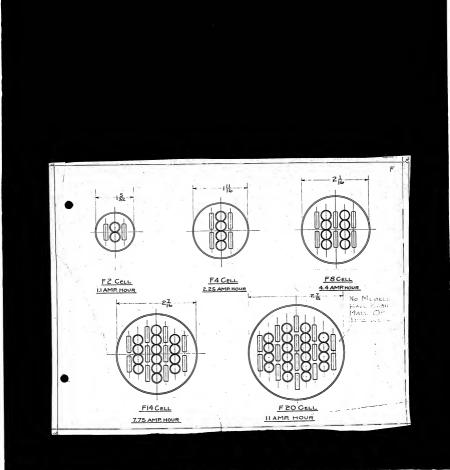
Jalu Knobbek 10-2-1911

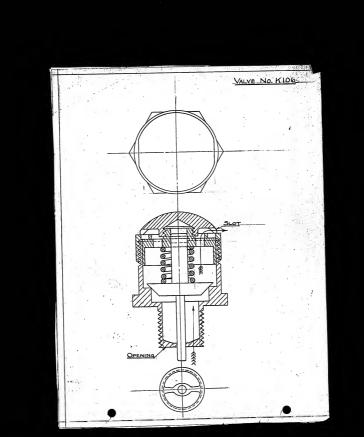












Patent Series

Patent Application Files

Folio # 814 Method of Recording Sounds

Serial #: 669868

Primary Applicant: Edison, Thomas A

Date Executed: 1/2/1912

Thomas R. E	nt.	Addres	
	Recording Son		
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Counsel,
Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON, a citizen of the United States, residing and having a Post Office address at Lievellyn Perk, West Orange, County of Essex, and State of Hew Jorsey,

prays that letters patent may be granted to him for the improvements in

- METHOD OF RECORDING SOURDS-

set forth in the annexed specification; and he hereby appoints Frank A. Dyer (Registration No. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and annendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KHOWN, that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Lievellyn Park, West Orange, in the County of Essex and State of New Jersey, have invented certain new and useful improvements in METHOD OF RECORDING SOURDS of which the following is a description:

My invention relates to methods of rocording sound, more particularly when the source of the sound is at a considerable distance from the recording instrument. The object of my invention is to provide an improved method of this character whereby sounds may be faithfully recorded and a record having good acoustic qualities obtained.

When the sound from a given source is recorded in a room, as has heretofore been oustomary, the walls of the room reflect the sound waves and those reflected waves after one or more reflections enter the horn of the recording instrument together with the true waves direct from the sound source, all of those waves being greatly amplified by the recording horn. As the reflected sound waves reach the recording instrument later than the direct waves, an objectionable sound interference is caused; so that when a record made in this way is reproduced, the reproduced sound is found not only to be different from that emanating directly from the original sound source, but also to be less agreeable and harmonious. When the source of sound is in close proximity to the horn of the recording instrument, this dopreciation in quality is not very noticeable, but when it is at a considerable distance from the

horn, as is necessarily the case with the different instruments of an orchestra which in rendering the selection to be recorded, the depreciation in quality is commiderable, this depreciation in many instances being so great that the reproduction of the sound as recorded for some of the instruments is very disagrecable.

I have discovered that the recording of these reflooted waves is the cause of the difference in quality between the sound as heard by the ear directly from the cridinal sound source and as heard from the ordinary phonograph rocord; and my invention accordingly contomplates the elimination of the reflected sounds or sound waves from the record. In accordance with my invention, I record the sound at a considerable distance from any means tending to reflect the sound into the horn of the recording instrument. This may bo done in the open air or, if desired, in a cenvas tent. In the latter case, the parth which, entire valle and not constitutes the floor of the tent, as well as the | walls of the tent, tend to dissipate rather than reflect the sound waves impinging on the same, so that none of these waves are recorded and it is possible to obtain a record of a high degree of acouracy and of good quality.

It is to be understood that I do not limit myself to the recording of the sounds in a tont, but that my invention contemplates generally the recording of sounds at a distance from any means tending to reflect the sound waves from the original source into the horn or receiver of the recording instrument.

Having now described my invention, what I claim as new and desire to protect by Letters Patent is as follows:

^{1.} The process of making original sound records which consists in locating the source of sound remote from

sound reflecting surfaces, causing the emission of the sounds to be recorded, and making a record thereof, substantially as described.

2. The process of making original sound records which consists in locating the source of sound and the recording instrument remote from surfaces, capable of reflecting the sound from the source into the recording instrument, causing the emission of the sounds to be recorded, and making a record thereof, substantially as described.

s. The process of making original sound records, bind consists in locating the source of sound in a tent free from sound reflecting surfaces, causing the emission of the sounds to be recorded, and making a rocord thereof, substantially as described.

consists in causing the emission towards recording instrumont of the sounds to be recorded, and dissipating the sound
waves not directly convoyed from the sound source to the
recording instru-

which consists in locating the source of sound and the recording instrument in a housing hoving non-sound-reflecting walls and free from surfaces compatible of recibeting the sound from the source into the recording instrument causing the emission of the sounds to be recorded, and making a record thereof, substantially as described.

Investil- 6-laines 5-10 me. 123,5

This specification signed and witnessed this 2 day of James 1962

Thos. A Educar

1. Francish Bachmann

2. Donna P. Klehm

Oath.

State of New Tersey Ss.,

THOMAS A. EDISON . the above named petitioner, being buly sworn, beposes and says that he is a citizen of the United States, and a resident of Liewellyn Park, West Orange, Rosex County, New Jorson

that he berily believes himself to be the original, first and sole inventor of the improvements in METHOD OF RECORDING SOUNDS

bescribed and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his inherition or biscobere; thereof; or patented or bescribed in any printed publication in the United Setates of America or any foreign country before his inherition or discovere; thereof, or more than two pears prior to this application; or patented in any country foreign to the United Setates on an application filed more than twelve months prior to this application; or in public use or on sale in the United Setates for more than two pears prior to this application; and that no application for patent upon said indention has been filed by him or his legal representatives or assigns in any foreign country.

Sworn to and subscribed before me this and day of summy 1902

[Seal]

l Div. --- 23 Room ---- 379 rescaly siener of Petente Commissioner of P. Weshington, D. C. J.H.D. -3.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

February 14,1912.

Thomas A. Edison, Care prank L. Dyor, Orange, New Jersey .

Please find below a communication from the EXAMINER in charge of your application.

for Method of Recording Sounds, filed Jan. 5,1912, serial number 669,868 .

All surfaces reflected sound somewhat, The matter of reflection by different substances being a matter of degree. Accordingly the process of claim 1 is impossible of performance and the claim is accordingly rejected.

It is old to make the walls of a sound recording chamber non reflecting for a portion of their area as see Prescott, July 26,1910, #965,327, (181-30). It is also well known to provide a non reflecting surface for a greater or less portion of the interior walls of an auditorium, see pages 92 and 93 of Kelly's Architectural Acoustics, published in 1898 by mension and Wesley Print, Buffalo, New York, a copy of which volume may be found on the oxaminer's deak and the disclosure in the Scientific American of June 19,1909, page 461 in an article entitled, Method of Correcting Paulty Acoustic Properties of Public Halls. In view that it is well known to surround partly a source of sound where it is desired to prevent reflection, invention is not found in extending the degree of such enclosure even to the extent of total inclosure. Moreover, it being desired to prevent reflection, the most obvious thing to do is to locate the source of sound and recording instrument where there is an absonce 1 of reflecting surfaces and it is not seen that

#669,,868----2.

invention is involved in selecting such place. Accordingly all of the claims are rejected.

Claims 1, 2 and 4 are additionally rejected as specifying no more than using any well known recording instrument out of doors, a process that is not a subject of patentability.

Claim 3 is additionally rejected as specifying no more than using any common recording instrument in a tent, which is held not to be of patentable subject matter.

IN THE UNITED STATES PATENT OFFICE

Thomae A. Edieon
METHOD OF RECORDING SOUNDS
Filed January 6, 1912
Serial No. 669,868

Room No. 379.

HONORABLE COMMISSIONER OF PATERTS.

SIR:

In response to the Office action of February 14, 1912, please aren'd the above entitled case as follows:

In line 16, page 2, after "done" insert - with the source of sound and the rocording instrument -; in line 17, same page, cancel "canvas" and after "tent" insert - or housing of heavy fabric, such as canvas -; and in line 18, same page, change "walla" to - entire walls and roof -.

In line 3, claim 2, change "capable of reflecting" to - tending to reflect - .

In lines 4 and 5, claim 5, change "capable of roflecting" to - tending to reflect - .

Cancol claim 1 and change the numerals of claims 2 to 5 inclusive to 1 to 4 inclusive.

Add the following claims:

which consists in locating the source of sound and the receiver of the recording inetrument in a housing, the entire walle, roof, and floor of which tend to dissipate the sound waves impinging thereon, causing the emission of the sounde to be recorded, and making a record thereof by means of said recording instrument, substantially as described.

6. The process of making original sound records which consists in locating the source of cound and the receiver of the recording instrument in a housing having walls of yielding sound dissipating material and free from surfaces tonding to reflect the sound waves from the source into the recording instrument, causing the emission of the sounds to be recorded and making a record thereof, substantially as described. 2/8/14

with the source of sound at a considerable distance from the re The process of making original sound records which consists in locating the source of sound and the receiver of the recording instrument in a housing having walls of sound discipating fabric and free from surfaces tending to reflect the sound waves from the source into the recording instrument, causing the emission of the sounds to be recorded and making a record thereof, substantially as described.

with the same of sound at a conscientile distance from the recording or 8. 2hb process of making original sound records, which consists in locating the source of sound and the receiver of the recording instrument in a housing having walls of heavy sound dissipating fabric and free from surfaces tending to reflect the cound waves from the source into the recording instrument, causing the emission of the sounds to be recorded and making a record thereof, sub-

the the source of sound at a somiderable distance from the recorder 9. The process of making original sound records which concists in locating the cource of sound and the receiver of the recording instrument in a housing having walls and a roof/of sound dissipating fabric and a sound dissipating floor, causing the emission of the sounds to be recorded, and making a record thereof by means of said

ctantially as described.

recording instrument, substantially as described.

10. The process of making original sound records, which consists in locating the source of sound and the receivor of the recording instrument in a housing having walls and a roof entirely of heavy sound discipating fabric and a sound dissipating floor, causing the emission of the sounds to be recorded, and making a record thereof by means of said recording instrument, substantially as described.

REMARKS

Hone of the reforences discloses applicant's. invention. According to the disclosure of the patent to Prescott, some of the sound waves pass to the recording instrument directly while others are reflected from the surface 3 to the recording instrument; so that the corresponding direct and reflected sound waves reach the recording instrument at different times and the objectionable sound interference, which it is applicant's object to eliminate, is produced. Hone of the other references discloses a process of making sound records. The mere disclosure of an auditorium provided with a non-sound-reflecting surface for a portion of its interior walls, which is evidently what the Examiner desires to show by these references, does not, it is thought, constitute an anticipation of applicant's invention. In the first place, the necessary arrangement of parts to produce A applicant's process is not disclosed or suggested in those reforences, there being no disclosure or contemplation whatever of a sound recording instrument. In the second place, these references do not, as stated above, even

suggest a process of making sound records. The decisions are clear on the point that a process As not necessarily anticipated by apparatus even if that apparatus might have been used to carry out the process. See for example, Carnegio Steel Co., Ltd. v. Cambria Iron Co., 22 S. Ct. 698; 188 U.S. 405; 46 L. Ed. 968; 99 O.G. 1866; 1908 C.D. 592, in which it was hold:

"To anticipate a process patent it is mecansury not only to them that the prior patent might have been used to carry out the process, but that such use was contemplated or that it would have occurred to an ordinary mechanis in operating the device."

In the present case, the apparatus disclosed in the references is not even capable of carrying out the process set forth in the claims.

Referring to the last two paragraphs of the last Office action, it is pointed out that the Examiner's attrements as to what, the claims in question specify, arenos entirely accurate in that these claims specify a process in which the source of cound and recording instrument are remote from surfaces tending to reflect the sound waves from the source into the recording instrument. Of course, applicant's process would not be anticipated by recording out of doors if such recording were done in the vicinity of a large surface capable of reflecting the sounds from the source into the recording instrument. If the claims are properly construed, it is not soon upon what ground the Examiner could, in the absence of pertinent references, held that the process covered thereby, is upparentable.

Applicant has obtained improved results by the process act forth in the claims; and as the latter, including the new claims, are not anticipated by the reference, reconsideration and allowance are respectfully requested.

Respectfully submitted,

THOMAS A. EDISON

France L. Dyer 1

Orange, New Jorsey, January 23, 1913. d Div. 23 Room 37

2--260

Paper No. 4, ReJ.

All communications respecting this plication about give the serial number,

J.H.D.-Sut.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON

February 26, 1913.

Frank L. Dyer,
Orange, New Jersey

U.S. PATENT OFFICE, FER 981018 MAILED.

Please find below a communication from the EXAMINES in charge of the application of
Thomas A. Reison, merial number 669,868,filed Fan. 6,1012, for
Method of Recording Sounds .

Sollistic.

This action is responsive to the amendment filed Jan. 24, 1913 .

Applicant is required to file a drawing in this case illustrating the process claimed.

Claims 1 and 3 are rejected as specifying only amplifyment. of any conventional, recording machine out of doors remote from reflecting surfaces.

Claim 2 is rejected as specifying only the use of any conventional recording machine in a tent, as for example, the use of any diotating machine as Tainter, Dec. 27, 1887, #375,579, (181-2).

Furthermore, all of the claims are rejected upon the publications of record or the following: an article estitled "Architectural Acoustics" by N. R. Watson, in the Scientific American Supplement, 1909, volume LXVIII, page 391, New York, Munn & Co., or a volume entitled Acoustics In Helation To Architecture and Building, by T. Rogers Smith, page 39, London, 1876, Virtue and Go., Ivy Lane, in view of Prescott of record-

The publications cited show it to be well known when a

#669,868----2.

reflection of sound produces an undesirable result to provide the reflecting surfaces with sound absorptive material, invention: cannot be found in applying this known principle and expedient in a recording chamber, especially when such expedient is shown to be old to cover up all of that part of the surface which the patentee desired should not be reflective Applicant's choice of how much of the surface of the chamber should not be reflective cannot be seen to be a display of invention.

IN THE UNITED STATES PATERT OFFICE.

THOMAS A. ECISOE,

METERD OF RECORDING
SCUEDS,

Placed January 6, 1912,
Serial No. 669,668.

HONORABLE COMMISSIONER OF PATERTS,

SIR:

In response to the Office action of February 26, 1915, please emend the above entitled case as follows:

In line 1, claims 1, 2, 4, 5, 6, 7, 8, 9, and 10 after "records" insert - with the source of sound at a considerable distance from the recording instrument - .

In line 1, claim 3, after "rocords" insert - with the sound source at a considerable distance from the recording instrument - ; and in line 2, same claim, change "a" to - the - .

REMARKS

A frawing illustrating the process claims will be filed as soon as the pater.tability of the claims is determined.

It is submitted that the claims as now presented are not articipated by the prior art of record; and it is thought that this will appear very clearly if the Hororable Exeminor will consider in connection with the prior art the problem solved by applicant and the results obtained by the invertion. It is no doubt well known to the Exeminor that the sours records of the

prior art give an unratural and imperfect reproduction. The applicant's problem was to improve the roproductive qualities of such records, particularly when the records are made with the source of the sound to be recorded at a considerable distance from the recording instrument. In working upon this problem, applicant discovered, as stated in the second paragraph on page 2 of the specifioution, that the recording of reflected sound waves is the cause of the difference in quality between the sound as heard by the oar directly from the original sound source and as heard from the ordinary phorograph record. It should be borre in mind that this discovery is essential ly connected with applicant's invention. Having made the said discovery, applicant evolved a sound recording process which eliminated the reflected sounds or sound waves from the record. By means of this process, he found that he could make a sound record capable of reproducing the original sound with a surprising increase in faithfulness. An improved result was thereby obtained.

lict one of the references of record discloses applicant's invertion. The argument made in correction with the last amendment that none of the references discloses either applicant's process or apparatus whereby the same may be carried out, still applies in spite of the new citations made by the Examiner, attention being again directed to the sand argument. The Examiner, it is thought, fails to take into consideration that upplicant's problem was to record sounds and not morely to prevent the reflection of sounds, and that applicant made the valuable discovery that the recording of the reflected waves is the cause of the difference in quality between sounds as heard by the ear directly from the original sound source and se heard from the original record. The claims do not call for a process for

preventing the reflection of sound waves, they call for a process of making original accurat records with the course of sound at a considerable distance from the recording instrument, and the publications cited do not suggest any such process.

All the claims have been smoraded so as to more clearly define the irvertion by the addition of the statement that the source of sound is at a considerable distance from the recording instrument.

With reference to the grounds of rejection ethical by the Krmether in the third and fourth paragraphs of the last Office action, attention is directed to the amendments make in the clutten and else to the argument made above. There is no suggestion in the prior art of recording counds out of doors remote from reflecting surfaces or in a tert free from sound reflecting surfaces, the source of sound being located at a considerable distance from the recording instrument.

Applicant has inverted a new process involving an important discovery, producing an improved result, and not discolosed by the prior art. The claims are thought to properly define the invertion; and reconsideration and allowance are respectfully requested.

Respectfully submitted,

THOMAS A. EDISON,

Orange, New Jersey, February 3. 1914.

FB-KCK

2-260

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

LOE-Su

e 6-20H

WASHINGTON March 19, 1914.

Frank L. Iyer,

Orange,

J. J.

Please find show a communication from the ELABIRES in charge of the application of

Thomas A. Edison, for Method of Recording Sounds, filed Jan. 5,

1912, Serial No. 669,868.

Thomas Ewing

In response to amendment of Peb. 4, 1914.

all of the claims are rejected upon the references and for the reasons of record. The common limitation that applicant has appended to the claims by the above noted amendment is clearly shown in Prescott of record. As a clear issue has been reschied between applicant and this office as the the patentability of the subject matter of these claims, no reason is seen for further presention before the examiner. Accordingly, the rejection of the claims is made final. Ex parte INIIor, 150 0. 0., 887.

Occa Dec. 27, 1711

Rgal DEpt

Legal DEpt

Voctent.

Before this moretion records for the shonograph have been recorded in tooms, which have an Echo, the secondary a Tertiany attended in the walks affection are very greately according by the horn which it is nearwary to use weth the shonogh when recording the reflected bounds from the reflected bounds produce winfecence

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Claim - Recording Down when the sounce is so distant from souled

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Dec 27 1911

Patent Series Patent Application Files

Folio # 815 Method of Making Sound-Record Molds

U.S. Patent #: 1099349

Primary Applicant: Edison, Thomas A

Date Executed: 1/2/1912

no 22, 1911 peaning the Gac

Stre New Repoter for Cylinder with deap box to allow The saft Long string used in desc suppler -See 6.5 pole 4675 30 his 94-100 ft 1941

Patent Series

Patent Application Files

Folio # 819 Charging Storage Batteries

U.S. Patent #: 1143818

Primary Applicant: Edison, Thomas A

Date Executed: 1/12/1912

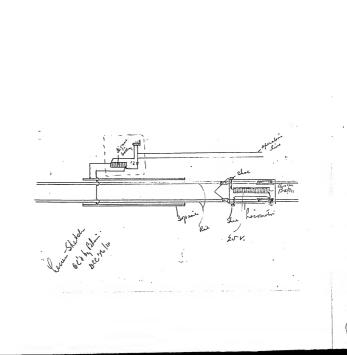
hepetitet Patent Dec 17 1911

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Patent Series Patent Application Files

Folio # 820 Phonograph-Record

U.S. Patent #: 1111999

Primary Applicant: Edison, Thomas A

Date Executed: 1/19/1912

The abject of their invention is improve the quarry of phonograph viceonds employing hand watering like Collection this spood which is improved by head a grevour by intervening Getween the backing suchas plader of paris of a saftnialmine Ceko Rubbai -Collulard Rutar 1011 Mr Philpet wece goos you

Patent Series

Patent Application Files

Folio # 821 Concrete Furniture

Serial #: 674274

Primary Applicant: Edison, Thomas A

Date Executed: 1/24/1912

Applicant.	Address.
Thos. A. Edison	The same of the sa
	administration of the second s
and the second second	All the second of the second s
Title Concrete Furniture	
Filed Jan. 30:1417	Examiner's Room No.
Assignee	The second contract to
Ass'g't Exec Reco	orded Liber Page
Patent No.	Issued
	ACTIONS.
	1913 17
15	FRANK L. DYER,
Y	Orange, New Jersey.

82/

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON a citizen of the United States, residing and having a Post Office address at Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

CONCRETE FURNITURE

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Aegistration No. 560), of Grange, New Jersey, his attorney, with full power of substitution and reducation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

This. A. Edisons

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Perk, West Orange, Essex County, New Jersey, have invented certain new and useful improvements in CONCRETE FURNITURE, of which the following is a specification:-

My invention relates to the production of articles of furniture of concrete, and has for its object the provision of articles of this character which are etrong, durable, fire-proof, cheaper than wood, and not subject to the deteriorating influences which affect wood.

My invention consists generally in furniture, each article of which comprises a skeleton or framework which of iteelf has sufficient strength to be self-sustaining and to withstand usage without breaking, the said skeleton or framework being covered with concrete. I may form the skeleton or framework as an integral structure or of parts secured together, assemble the framework thus formed in a suitable mold, and pour into the mold and around the framework a suitable concrete mixture. Or, I may mold the concrete around separate parts designed to form the framework of the article of furniture to be constructed, and then secure together the composite members thus formed. I prefer to employ metal for the framework.

In order that my invention may be better understood, reference is had to the drawings accompanying and forming a part of this epecification, and in which - Figure 1 is a perspective view of a chair conetructed in accordance with my invention; and

Pigure 2 is a sectional view of parte ready for assembling to form a portion of a bedstead constructed in accordance with a modified form of my invention.

Referring particularly to Figure 1, in full lines at $\underline{1}$ is shown a skeleton or framework which is. preferably made of eteol hollow pieces, such as pipee, in order to give lightness combined with the requisite strength. The pieces may be secured together by sorew joints like those used with ordinary piping, or may be welded together by any suitable process as for example by the oxacetylene torch. Or, some of the joints may be made by welding and the others by other methods or means. The framework is then placed in a suitable sectional mold and positioned in the mold by small pieces of metal or concrete and surrounded by the cement mixture. After the cement mixture has hardened, the sections of the mold are removed, and the framework is left covered with concrete as is shown in dotted lines at 2. The article is then ready for use or for further treatment euch as painting.

An article of furniture may also be constructed in accordance with my invention by forming composite members adapted to be secured together after molding. In Figure 2 I have shown several such composite members adapted to be secured together to form a portion of a bedetead. Each of these members consists of a frame piece 10 of suitable size and chaps and preferably of steel tubing or piping. Each frame member is provided with means for factoning it

to adjacent members to which it is designed to be secured, as for example, serew threaded extensions 11 or serew threaded mockets or couplings 12. Each frame member has a covering of concrete molded thereon. A complete article of furniture in which the joints between adjacent sections are scarcely perceptible may be formed by securing together and a composite members.

I prefer to employ a cement mixture or concrete of the character described and claimed in my application Serial No. 639,752, filed July 21, 1911. This cement mixture or concrete consists of cement, preferably Portland, mixed with very light porous sand or other aggregates, such as pumice stone, charactel, coke, or furnace slag made porous by steam or other gases blown through the nolten mass, and water.

The concrete surrounding the skeleton or framework may be molded in highly ornsmental shapes. As the framework is made strong enough to be self-sustaining, and furthermore the steel has great strength in tension and the concrete considerable strength in compression, the composite article is of great strength as compared with articles made of reinforced concrete where the skeleton itself is not formed into or does not constitute a self-sustaining skeletom or frame.

In accordance with my invention, chairs, sofas, tables, bureaus and almost every article of household furniture may be constructed. These articles may be made of a highly ornamental character with a chearness unattrinable by the use of wood, and may be very light in weight, if desired.

The article may be pointed, gilded or otherwise colored in any desired manner. Portions of articles of furniture as well as complete articles may be constructed in accordance with my invention.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:-

- 1. An article of furniture including a self-sustaining freework covered with concrete, substantially as described.
- 2. An article of furniture including a solf-sustaining metallic framswork covered with concrets, substantially as described.
- an article of furniture including a self-sustaining metallic framework covered with concrete composed of coment and porous aggregates, substantially as described.
- An article of fubriture including a self-sustaining metallic framework covered with concrete composed of Portland commont and porous aggregates, substantially as described.
- An article of furniture including a self-sustaining metallie framework covered with concrete composed of Portland comment and pumice stone, substantially as desoribed.
- An article of furniture including an integral self-sustaining framework covered with concrete, substantially as described.

- 7. An article of furnitive including an integral solf-sustaining metallic framework covered with concrete, substantially as described.
- An article of furniture including an integral self-sustaining motallic framework covered with concrete composed of cement and porous aggregates, substantially as described.
- An article of furniture including an integral self-sustaining metallic framework covered with concrete composed of Portland compant and porous aggregates, substantially as described.
- 10. An article of furniture including an integral self-sustaining metallic framework covered with concrete composed of Portland cement and pusice stone, substantially as described.
- 11. An article of furniture including composite members secured together, each of said members consisting of an inner frame member and an outer overing of concrete, substantially as described.
- 12. An article of furniture including composite members secured together, each of said members consisting of an inner metallic member and an outer covering of concrete, substantially as described.
- 13. An article of furniture including composite members secured together, each of said members consisting of an inner metallic member and an outer covering of concrete composed of coment and porous aggregates, substantially as described.

Cancelet 2 . 5

14. An article of furniture including composite members secured together, each of said wembers consisting of an inner) metallic member and an outer covaring of concrete composed of Portland comment and porous aggregates, substantially as described.

- 15. An article of furniture including composite members secured together, each of said members consisting of an inner metallid member and an outer covering of concrete composed of Portland coment and pumice stone, substantially as described.
- 16. An article of furniture including metallic members covered with concrete, said members being secured together and constituting a solf-sustaining framework, substantially as described.
- 17. The process of making furniture which consists in forming a self-sustaining framework and molding concrete thereon, substantially as set forth.
- 18. The process of making furniture which consists in forming a self-sustaining metallic framework and molding concrete thereon, substantially as met forth.
- 19. The process of making furniture which consists in forming an integral metallic framework and molding concrete thereon, substantially as set forth.
- 20. The process of making furniture which consists in forming a self-sustaining metallic framework and applying thereto a covering of concrete composed of cement and porous aggregates, substantially as set forth.

Barceled 2 1,18

21. The process of making furniture which consists in forming a colf-containing motallic framework and applying thereto a covering of concrete composed of Portland coment and persus aggregates, substantially as set forth.

22. The process of making furniture which consists in forming a solf-sustaining metallic framework and applying thereto a covering of concrete composed of Portland coment and pumice stone, substantially as set forth.

23. The method of making furniture which consists in forming frame members adapted to be accured together, overring the same with concrete so as not to interfere with the securing means, and accuring together the composite members thus formed, substantially as set forth.

24. The method of making furniture which consists in forming metallic frame members adopted to be accured together, covering the same with concrete so as no to interfere with the securing means, and accuring together the composite members thus formed, substantially as set forth.

Smert 2-6 Com. 1-13 - Fet 11 1913

This specification signed and witnessed this and day of Jan. 1912.

Witnesseth:

1. Henry Lanahan 2. Anna P. Keehn

Oath.

State of New Jersey \ ss., County of Essex

, the above named THOMAS A. EDISON petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of West Orange, Essex County, Hew Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

CONCRETE FURNITURE

described and claimed in the annexed specification; that he does not know and does not beliebe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

ntatives or assigns in any foreign commun.

Thro F. Edison

Sworn to and subscribed before me this 24 day of form. 1912

Frank Politic.

[Seal]

155. CHA 614.274 Div. 4 v 1 Fig.1 FEG.Z t.' his Site 18

Thomas A. Edison.

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE WASHINGTON

Feb. 13. 1912 U. S. PATENT OFFICE. rep 18 1912 MAILED.

o /o Frank L. Dyer.

Orangs, E.J.

Please find below a communication from the EXAMINER in charge of your application. \$674,274, filed Jan. 20, 1912, for Concrete Furniture.

EBMsore!

Applicant's attention is called to Ex parte Chapman, 120 O.G., 2446; Ex parte Riley, C.D., 1902, pags 416; and Ex parte Kadow, 154 O.G., 1413, regarding multiplicity of claims and claims not patentably different. For instance, claims 6, 7, 8, 9, and 10 differ from claims 1, 2, 3, 4, and 5, respectively, only in the insertion of the word "integral" in each claim. This is an unnscessary multiplication of claims. A single claim will cover this difference just as well as fivs.

Claims 11, 12, 13, 14, and 15 are objectionable for similar reasons.

Claims 3, 4, 5, 8, 9, 10, 13, 14, 15, 20, 21, and 22 ars all objectionable in that they attempt to combine and confuse structural slements of which an article is composed, and a composition of matter. It is of no consequence in applicant's device of what particular composition the conorste clement be formed, or which one of the innumerable concrete compositions applicant prefers to use in his construction, and applicant should not, therefore, attempt to define a novel structure in his claim, by setting forth the chemical composition of one of its elsments. The particular composition of applicant's concrsts elsment /is old in Lands, 299,810, Jan. 3, 1884; Parshall, 323,722, Aug. 4, 1885, Class 106/242, and the recital, therefore, of this particular composition, even were it proper to do so, dooe not affect the novelty of the alleged combination set forth.

All the claims are anticipated by "hurns, 909,840, Jan. 12, 1909, or = English patent, 2027 of 1874, Chaire; or Price, 946,776, Feb. 8, 1910, Tables,

in view of

Noll, 910,956, Jan.26, 1909, oreco-reforence in Tablee, Podcetals, orow, 839,272, Dec. 25, 1906, Claco 72/85.

The first three references show it to be eld to mold furniture from cement and other materials having similar properties, providing suitable metallic or other reenforcing means to strengthen the structure, either by arranging the reenforce and melding the cement about it, or forming an outer metallic shell and filling it with cement as in Eurne. Noil shows it to be old to form a composite structure by molding each individual section about a reenforcing member and then connecting the members together by suitable means. Crow chows a structure built up of sections sach comprising a metallic pipe, threads at the sade, and surrounded by osmont, the finished sections boing afterwards accembled by means of the identical joint shown in applicant's Fig. 2. To apply this structure to the furniture chown in hurns, finglish patent or Price would involve only the exercise of mechanics; skill.

Attention is oalled to Small, 590,690, Sept. 28, 1897, Clase 72/70, and Graham, 865,490, Sept.10, 1007, Clase 72/15.

All the claims are rejocted.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison CONCRETE FURNITURE Filod January 30, 1912 Sorial No. 674,274

Room No. 131

HONORABLE COMMISSIONER OF PATENTS,

BIR:

In response to the Office action of February 13, 1912, please amond the above entitled case as follows:-

Cancel the claims and insert the following: -

- 1. An article of furniture comprising a structure consisting of a framework of composite mombers, said composite members each being composed of a metallic member exteriorly covered with concrete, and anid metallic members being united to form a self-sustaining ekeleton framework, substantially as described.
- 2. An artials of furniture comprising a structure consisting of a framework of composite members, said Composite members each being composed of a metallic member exteriorly covered with concrete containing porous aggregates, and soid metallic members being united to form a self-souteaining skeleton framowork, substantially as described.
- 3. An article of furniture comprising a structure consisting of a framework of composite members, said com-

posite members each being composed of a metallic member exteriorly covered with concrete centaining aggregates of pumice stone, and said metallic members being united to form a self-sustaining skeleton framework, substantially as described.

- An article of furniture comprising a structure consisting of a framework of composite members, said composito members each being composed of a metallic member exteriorly covered with concrete, and said metallic members being united to form a self-sustaining integral skeleton framework, substantially as described.
- Antable 3/16/14 An article of furniture comprising a structure consisting of a framework of composite members, said composite members each being composed of a metallic member exteriorly covered with concrete centaining porous aggregates, and said metallic members being united to form a self-sustaining integral skeleton framework, substantially as described.
- An article of furniture comprising a structure consisting of a framework of composite members, said composite members each being composed of a metallic member exteriorly covered with concrete containing aggregates of pumice stone, and said metallic members being united to form a self-sustaining integral skeleton framework, substantially as described.
- Concelled 3/16/14 7. The process of making furniture, which consists in forming a self-sustaining metallic skeleton framework, and molding concrete upon the members of said framework to cover the same and form a composite framework structure, substantially as set forth.

- 8. The process of making furniture, which consists in forming a celf-suptaining metallic skeleton framework, and molding concrete containing porous aggregates upon the members of said framework to cover the same and form a composite framework stucture, substantially as set forth.
- 9. The process of making furniture, which consists in forming a self-emataining metallic skeleton framework, and molding concrete containing aggregates of pumice stone upon the members of said transmork to cover the same and form a composite framework structure, substantially as set forth.
- 10. The process of making furniture, which consists in forming a self-ountaining wintegral motallic skeleton framework, and modding concrete upon the members of said framework to cover the esme and form a composite framework structure, embatantially as set forth.
- 11. The process of making furniture, which consists in forming a self-sustaining integral metallic stellation framework, and molding concrete containing porous aggregates upon the members of said framework to cover the same and form a composite framework structure, substantially as set forth.
- 12. The process of making furniture, which consists in forming a self-sustaining integral astallio skeleton framework, and molding concrete containing aggregates of punice stone upon the members of said framework to cover the same and form a composite framework structure, substantially se set forth.

Conveled 3/10/14

13. The process of making furniture, which consists in forming a self-susbeining metallic framework, assembling the framework in a suitable mold, pouring into the mold and around the framework a concrete mixture containing aggregates of pusics stone, and removing that mold after the concrete has hardened, substantially as set forth.

REMARKS

While it is not thought that the claims canceled are properly anticipated by the references cited, new claims have been submitted which are believed to define applicant's invention more accurately. The concrete mixture described in the patent to Lande, No. 299,810, is intended to form a hard durable artificial stone which will not easily chip or wear. There is no disclosure of a relatively light composition intended to cover a metallic framework to form an article of furniture. It does not appear that the iron slag used by Lande is porous. In the composition described in the patent to Parshall, No. 323,722, a material of stiff consistency is produced which is not capable of being poured, as is the case with the concrete mixture employed by applicant, but is applied with a trowel. Furthermore, the pumile stone employed in the mixture of Parshall is finely pulverized and not employed in the form of aggregates as in applicant's mixture. The fine pulverizing of the pumice stone serves to destroy its porous structure and does not afford a resulting composition of the requisite lightness. The patent to Burns, No. 909,540 shows a sheet metal structure which is filled with a composition of matter capable of hardening, but does not show a self-sustaining framework

in which the members are covered exteriorly with a concrete mixture. The patent to Price, No. 948,770, does not disclose a structure in which there is a self-sustaining framework. British patent No. 2027 of 1874 is rather indefinite in its disclosure, on account of the large number of substances referred to in general terms. It is not believed that the disclosure of this patent is of such a character as to enable one skilled in the art to carry out the invention without prolonged experimenting. It seems clear, however, that this patent does not show a self-sustaining metallic framework, and the material molded is molded by pressure and not poursd. The patent to Noll, No. 910,950, shows a concrete fence made up of members, but does not show a self-sustaining metallic framework. The patent to Crow. No. 839,272, shows a pols mads of cement covered members joined together, and does not show a framswork. No specifio compositions are disclosed in the patents to Burns, Price, Moll, Crow, Small, or Graham. In the structures shown in the patents to Small and Graham, the resulting structure doss not constitute a composite framswork structure.

It is believed that applicant is ontitled to specify or set forth the characteristics of the concrete employed to cover the skeleton framswork in some of the claims, insumuch as the character of this material is of importance in rendering applicant's invention practicable. Furthermore, it is believed that there is a patontable distinction between those claims in which an integral skeleton framswork is recited and those claims in which the integral feature is omitted, insumuch as there are certain advantages

secured by having the skeleten framework integral, and structures having the integral framework constitute one species of applicant's invention.

It is thought that the claims now presented distinguish patentiably from the art cited. Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON
By Frank L. Dyer

His Attorney

Orange, New Jersey

February 11th, 1913.

Div......8 Room 131 65

2-260

Paper No.4.
All communications respecting this opplication should give the serial number date of filling, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Harch 18, 1913.

	1 NAT 544
Frank L. Dyer,	25 5 1 - 2 -
Orengo H. J.	

Please find below a communication from the EXAMINER in charge of the application of Thomas. A. Rison, \$574,274 filed Jan. 39, 1912 for Genorate First ture.

> SBMS075/ Quantissimer of Patenta.

Amendment of Feb. 12, 1913 is of record.

Claims I to 6 are rejected on the English reference 2027, of 1874 of record. This patent describes and shows a skeleton framework bovered with concrete. They are also rejected on Burns in view of Moll, both of record. In view of Moll's showing, the application of the concrete to the exterior of the skeleton frame work instead of the interior is devoid of all novelty. These claims are also believed to be fully anticipated by Graham of record, or frow of record, who have a self supporting skeleton frame work to which concrete is applied exteriorly. It is not believed that the argument of non-analagous art applies merely because applicant has chosen another form of article to illustrate his idea. The result desired and means by which it as accomplished is the same in these cases.

Olaims 5, 5 and 6 are further wejected on the ground of aggregation. There is no relation between the structural arrangement and the kind of material used. Adding to the practicebility of the devices, even if true, (being a matter of opinion merely) cannot affect the question of patentable combination. Moreover the material used is disclosed by Parshall of record, the size of aggregate being necessarily dictated by the finish desired. The usea, of concrete in stiff and web conditions and their respective

674,274----2.

advantages are well known and in cannot therefore affect the applicability of a reference. Applicant's attention in also called to the statements made in the previous Office action on this point.

The remaining claims are rejected on 886,877, Senor, May, 5, 1908. They are also rejected on the ground that they are claims for a non-patentable process. The steps mentioned are obvious from the finished article and fully disclosed by it.

It is not believed that the applicant has differentiated or attempted to differentiate from the previous claims or limited their scope and therefore a reiteration of the previous and objections is sufficient; but that the issme may be as clearly defined as possible, a further application and explanation of the references has been attempted.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edieon
COMORETE FURNITURE
Filed January 30, 1912

Room No. 131

Serial No. 674.274

HONORABLE COMMISSIONER OF PATENTS,

SIR:- In response to the Office action of March 18, 1913, please amend the above entitled case as follows:-

In line 1 of each of claims 1 to 6 inclusive, before "article" insert - portable - .

Cancel claims 7 to 13 inclusive.

REMARKS

The process claims have been canceled because it is believed that applicant's invention will be adequately protected by the article claims submitted. The article claims of the content of the patent of the content of

made upon it, the Examiner should point out what portion of the disclosure of the patent he relies upon. The patent to Burne, No. 909,540, shows a sheet metal structure which is filled with a composition of matter capable of hardening, but does not show a self-sustaining framework in which the members are covered exteriorly with a conorete mixture. The thin metal employed by Burns eimply eerves as a mold or frame for the article to give the same form while it is being made, and is not relied upon to furnish the strength necessary in an article of furniture. In applicant's invention the ekeleton or framework has sufficient strength of iteelf to be celf-custaining and to withstand ueage without breaking. The patent to Moll. 910,950 eimply chowe reinforcing tension members embedded in concrete. The patent to Graham, No. 865,490, shows an arrangement of reinforcing for building construction arranged within the body or mase of concrete to afford added strength thereto (see page 1 of Graham'e epecification. lines 10 and 11). In other words, Graham'e construction ie merely a variation of ordinary reinforced concrete construction. The patent to Crow, No. 839,272, does not show a framework covered with concrete but simply an elongated pole made up of concrete covered sections.

The Examiner has rejected claims 3, 5 and 6 on the ground of aggregation. It is believed that all parts of the structure defined in these claims co-operate to produce the desired result and that the rejection upon the ground of aggregation is untenable. As pointed out in the specification of this application and in the specification of applicant's prior application Sorial No. 639,752 referred to on page 3, the use of a concrete containing porous aggregates of pumics stone results in

a superior product for the purpose intended, and is believed to amount to invention. In this connection, extracts from the following decisions are cited:-

"The substitution of one material for another may amount to invention where a superior product results from the substitution." Eureke Blotter Bath Company vs. Micholas et al. 157 F. 556.

"The use of a different material in electroting an article previously patented involves invention where it produces a useful result, increased efficiency, or a decided saving in operation."

180 F. 789.

"The substitution of one material for another involves invention where the substituted material is used in a relation in which it had not before been used and in which it accomplished new and very beneficial results."

119 F. 505.

Furthermore, as pointed out in the argument proviously filed, the pumice stone employed in the mixture of Parshall, No. 323,722, is finely pulverized and is not employed in the form of aggregates.

Claims 4, 5 and 6 distinguish also from the referonces in reciting that the solf-sustaining skeleton framework is integral, which is a feature not shown in any of the reforences.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

Orange, New Jersey His Attorney
March 16, 1914

HL-JS

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

	att alteration of
New Jersey	
Orange,	MAILED.
Frank L. Dyor,	MAY 8 1914
	ILS. PATENT OFFICE,

Please find below a communication from the EXAMINER in charge of the application of Thomas A. Edison, Serial No. 674,274, Filed Jan. 30, 1912, for

Concrete Furniture.

In response to the amendment filed Mar. 17, 1914: The claims are each rejected on the references and for the reasons of record.

As the amendment does not in any way alter the scope of the claims, this rejection is made final.

Legal Deft - Remark Decroper

The object of their wortine to to provide man whereby anticles of furniture may be constructed out of cament,

The consider counts in forming a steel of skeldom afthe piece of functions afficient which about to will have sufficient breaking to the whole or parts affiliable charter abeliation placed in mould original which coment perforably Postand Ceremit is poursed, to full out the fleak to to sepack of the autistic deserted.

thestrated by a chair

Par par 20 19

In most cases then steel pipe is preferred to construct the akeleton of the article to be manufactured, to give lightness, the joint of the pipe may be seemed together by screw Jointo like that used with orking figur or where possible the joints can be I woulded together by the Exyrachyline Torch The chair Mustrated may be placed in a mound centralized by means of small person of metal or carrent The whole aunomhed with Cement or it may be moulded in several parts achees parts screwed lighther this is easily possible or fortherd Coment acurately follows the mould and has producidly the no appreciable expansion or contraction, in woulding hence the joint can scarcely be seen The concerts Employed settral desombed in my application brung inturely of purmice stone

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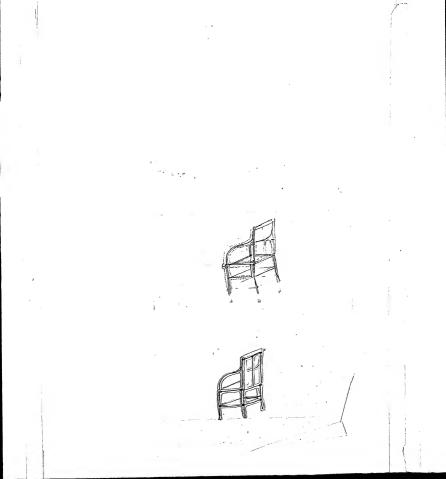
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Patent Series Patent Application Files

Folio # 825 Means for Reducing Sounds

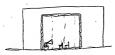
U.S. Patent #: 1190133

Primary Applicant: Edison, Thomas A

Date Executed: 2/15/1912

Mr. Mayer 20 Jary 1912 Jake aut custen patent

Room for seconding sounds on shows or Elimination of Echos



Room within a room the anallar room bring made of motions like sections, about 2 meches thick, the stuffing boung askertor febre 200 mixed will possible mederial like Manualle, Chalk Eto m and proportions as to make the matrices like walks light & Elastic.



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from the though fund is correct or hers no barrel sounds

Patent Series

Patent Application Files

Folio # 826 Insulating Coatings for Storage Battery Containers and Other Articles

Serial #: 679744

Primary Applicant: Edison, Thomas A

Date Executed: 2/23/1912

Applicant. Thomas A. Edison	Address.
Title Tisulating Contin	ga for Storage Battery, Containe as bother articles
Filed Feb. 24.1912	Examiner's Room No. 3 o 9
Assignee	and the second s
Ass'g't Exec	corded Liber Page
Patent No.	. Issued
	ACTIONS.
2 Amendment May 3. Rejected July 4. 6. 10 7 8 11 12 13	1912 10. 10. 10. 10. 10. 10. 10. 10. 10. 10.
15	30
	FRANK L. DYER, Counsel, Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EFISON, a citizen of the United States, residing and having a Post Office address at Llowellyn Park, West Orango, Basex County, New Jorney,

prays that letters patent may be granted to him for the improvements in

- INSULATING COATINGS FOR STORAGE BATTERY CONTAINERS
AND OTHER ARTICLES -

set forth in the annexed specification; and he hereby appoints Frank L. Wyer (Registration Lo. 560), of Grange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Vatent Office connected theretwith.



SPRCIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, THOMAS A. EDISON, a citizen of the United States and a resident of Lievellyn Park.

West Orange, Essex Gounty, New Jersey, have invented certain new and useful improvements in INSULATING COATINGS FOR STORAGE BATTERY CONTAINERS AND OTHER ARTICLES, of which the following is a specification:

My invention relates to the provision of an insulating and proteotive covering or coating for criticles of vertous kinds, and more particularly to the provision of such a coating for metal storage battery cens or containors, and for the trays in which the storage battery cells are assembled.

In storage batteries of the Edison type, the can or container is made of steel, and may or may not be nidokal-plated on the exterior. It is desirable to provide a protective and insulating coating upon the exteriors of these cans or containers, and in the practico of my invention as applied to such cans or containers. I proceed as follows: A very adherent, flexible and relatively soft, preliminary or first coating is provided preferably in the following manner: A solution consisting of a substance of asphaltic nature dissolved in a suitable solvent is prepared, and the can or container dipped therein so as to immerce as much of the can as it is desired

to coat. The solvent is permitted to evaporate, leaving the own or conteiner conted with a layer of the coft recidum of asphaltio nature. I have found that artificial asphalts, such as byerlyte and parolite, dissolved in bemaine, form excellent colutions for this purpose. The colution for the preliminary or first coating displaces all air from the surface of the can or container, and after evaporation of the solvent there is left a very adherent, flexible and relatively soft coating upon the can or container. This coating has insulating properties and is not attacked by the potesh or other strong alkalie which are contained in electrolytes of storage batteries.

After the preliminary or first coating is dry, the can or container is dipped into a hot molten insulating compound containing a halogon derivative of naphthalene so as to immerce the portion of the oan previously coated. The compound preferably employed is called "tetrol" and consists of tetra-chloro-naphthalene and asphalt. term "tetra-ohloro-naphthalone" is a trade designation for a product formed by the chlorination of naphthalene, which orystallizee as a felt of flexible, fibrous orystale. It is apparently a mixture of various ohlorine substitution products of naphthalens, probably the tri-, tetra-, and penta-ohloro-naphthalonee, having substantially the same average composition as tetra-ohloro-naphthalene. Tetrol is prepared by melting together suitable quantities of either orude or pure tetra-ohloro-naphthalene and aephalt. The preferred proportions for the tetrol are 2 pounds of

"A" California asphalt and six pounds of pure tetra-chloronephthalene. After removing the sen or conteiner from the melted tetrol, and permitting it to cool, it is found to be covered with an additional layer or coating of a rether hard and durable, insulating and protecting compound. I have found that a suitable thickness of the additional layer or coating for storage battery cans may be obtained by bringing the preliminarily coated can to a temperature of about 55° P. and dipping it into molten tetrol having a temperature of about 220° F., but the process may be carried on at other temperatures.

The layer or coating of tetrol is tough and flexible even at low temperatures and does not become soft or sticky until heated considerably above ordinary temperatures. It is not porous, and is not attacked by soids or alkalis, even when the soids or alkalis are hot. In my application Serial No. 504,926, filed January 27, 1911, I have described and claimed this insulating compound and the method of making it.

When tetrol is applied directly to articles to be coated, such as came or containers made of steel, it is liable to strip off. All liability to such stripping off is evercome by the use of the preliminary coating which is of a sticky nature and very adherent, and which is applied from a liquid which has displaced all of the air on the surface of the article. The preliminary or first coating is very adhesive and cannot be stripped off from the steel. The tetrol adheres perfectly to the preliminary or first coating and the two coatings form a single com-

posite coating which cannot be etripped off.

My improved procees ie applicable to other articles of verious kinds, such as wooden or metal trays for storage battery cells, conducting wires, armstures, and armsture and other coils, and may be carried out in the manner hereinbefore described in connection with the coating of storage battery cane or containers.

Having now described my invention, what I cleim as new therein and desire to protect by Lettere Patent is an follows:-

- The proceed of providing an article with an insulating coating, which consists in first applying a coating of adherent material to the article, and then applying a coating containing a halogen derivative of naphthalene, substantially as set forth.
- The process of providing an article with an inculating coating, which consists in first applying a coating of adherent material to the article, and then applying a coating containing a chlorine derivative of nephthelene, substantially as set forth.
- 3. The process of providing on article with an insulating conting, which consists in first applying a conting of adherent material to the article, and then applying a coating containing tetra-chloro-naphthalone, embatantially as set forth.
- 4. The process of providing an article with an insulating coating, which consists in first applying a

ocating of adherent material to the article, and then applying a coating containing totra-chlor-naphthalene and an amorphous substance, substantially as set forth.

- 5. The process of providing an article with an insulating conting, which consists in first applying a coating of adherent meterial to the article, and then applying a coating containing tetra-chloro-naphthalene and apphalt, substantially as set forth.
- 6. The process of providing an article with on insulating coating, which comeists in first applying a coating of adherent meterial to the article from a solution adapted to displace all of the air from the surface of the article, and then applying a coating containing a halogen derivative of naphthalene, substantially as set forth.
- 7. The process of providing an article with an insulating coating, which consists in first applying a coating of adherent material to the article from a solution adapted to displace all of the sir from the surface of the article, and then applying a coating containing a chlorine derivative of nephthelene, substantially as set forth.
- 8. The process of providing an article with an insulating ocating, which consists in first applying a coating of adherent material to the article from a solution shapted to displace all of the air from the surface of the article, and then applying a coating containing tetra-chloro-naphthelene, substantially as set forth.

- 9. The process of providing an article with an insulating coating, which consists in first applying a coating of adherent material to the article from a solution adapted to displace all of the air from the surface of the article, and then applying a coating containing tetra-chloro-naphthalene and an amorphous substance, substantially as set forth.
- 10. The process of providing an article with an insulating coating, which consists in first applying a coating of adherent material to the article from a solution adapted to displace all of the air from the curface of the article, and then applying a coating containing tetra-chloro-naphthalene and sephalt, substantially as set forth.
- 11. The process of providing an inculating coating for an article, which consists in first applying a coating of otherent, flaxible, relatively soft inculating material, and then applying a coating containing tetra-chloronephthalone, substantially as act forth.
- 12. The process of providing an insulating coating for an article, which consists in first applying a coating of adherent, flexible, relatively coft, insulating material, and then applying a coating containing tetra-chloromaphthalone and asphalt, substantially as set forth.
- 13. The process of providing an article with an insulating conting, which consists in first applying a solution composed of an adherent material of asphultio nature dissolved in a volatile solvent, permitting the solvent to evaporate, and then applying a coating com-

taining a helogen derivative of naphthalene, substantially as set forth.

- 14. The process of providing an article with an insulating conting, which consists in first applying a solution composed of an adherent material of asphaltic nature dissolved in a volatile solvent, permitting the solvent to evaporate, and then applying a conting containing a chlorine derivative of naphthelene, substantially as set forth.
- 15. The process of providing an articls with an insulating coating, which consists in first applying a solution composed of an adherent material of asphaltic nature dissolved in a volatils solvent, paraitting the solvent to evaporate, and then applying a coating containing tetra-chloro-naphthalens, substantically as sat forth.
- 16. The process of providing an article with an insulating coating, which consists in first applying a solution composed of an adherent material of sephaltic nature dissolved in a volatile solvent, permitting the solvent to evaporate, and then applying a coating containing tetra-chloro-naphthalene and an amorphous substance, substantically as set forth.
- 17. The process of providing an erticle with an insulating coating, which consists in first applying a solution composed of an adherent material of asphaltic nature dissolved in a volatils solvent, permitting the solvent to evaporate, and then applying a coating containing tetra-chloro-naphthalens and asphalt, substantially as set forth.

- 16. An article having a composite insuleting costing composed of an inner coating of adherent, flexible, relatively soft, insulating meterial, and an outer coating containing a helogen derivative of nephthalene, substantially as set forth.
- 19. An article hoving a composite insulating costing composed of an inner coating of adherent, flexible, relatively soft, insulating material, and an outer coating containing a chlorine derivative of nephthalone, substantially as set forth.
- 20. An article having a composite insulating conting composed of an inner coating of adherent, flatible, relativety sort, insulating material, and an outer scating containing tetre-chloro-naphi-alone, substantially as set forth.
- 21. An article having a composite insulating coating composed of an inner coating of adherent, flexible, relatively soft, insulating meterial, and an outer coating containing tetra-chloro-naphthalene and an amorphous substance, substantially as out forth.
- 22. An article having a composite insulating coating composed of an inner coating of adherent flexible, relatively soft, insulating material, and an outer coating containing tetra-chloro-naphthalene and asphalt, substantially sesset forth.
- 23. A storage bettery container having a composite insulating coating composed of an inner coating of adherent flexible, relatively soft, insulating material, and an outer coating containing a halogen derivative of nephthelene, substantially as set forth.

- 24. A storage battery container having a composite insulating coating composed of an inner coating of adhorent flexible, relatively coft, insulating material, and an outer coating containing a chlorine derivative of naphthalene, subtantially as est forth.
- 25. A storage battery container having a composite insulating occting composed of an immer costing of atherent floxible, relatively soft, inculating material, and an outer coating containing tetre-chloro-maghitaclone, substantially as not forth.
- 26. A storage battery container having a composite insulating coating composed of an imner coating of adherent flexible, relatively soft, insulating material, and an outer coating containing tetre-chlore-naphthalone and an amorphous substance, substantially as set forth.
- 27. A storage bettery container having a composite insulating coating composed of an inner coating of adherent flexible, relatively soft, insulating material, and an outcreasing containing tetra-chloro-maphthalone and asphalt, substantially as set forth.

This specification signed and witnessed this 23 rd day of February 191 \succeq Thomas A. Edism

Wlituesseth:

1. Henry Lanahan 2. Fruia P. Klehm

Oath.

State of New Jersey County of Essex

THOMAS A. 'DISON' , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the Clutted States, and a resident of Llowellyn Park. West Orange, Essex County, New Jersey.

that he verily believes himself to be the original, first and sole inventor of the improbements intersulating coatings for storage battery containers AND OTHER ARTICLES.

described and claimed in the annexed specification; that he does not know and boes not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 23 thought of February 1912

Frue P. Relling Bublic.

Donny Public.

[Seni]

308 Div. 15 Room

CST

Paper No.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

May 8, 1912. WASHINGTON

Thomas A. Edigon.

c/o Frank L. Dyer.

Orango, H. J.

U. S. PATENT OFFICE

Please find below a communication from the EXAMINER in charge of your application. for, INSULATING COATINGS FOR STORAGE BATTERY CONTAINER AND OTHER ARTICLES. filed Feb. 24, 1912. #679,744.

&BMsore!

This case has been examined.

Claims 1, to 17, inclusive are apparently mot in , Natting #797,702 Aug. 22, 1905 (91-68) with

Stampol #732,663 June 30, 1903 (sams) in view of the fact that applicants insulating compound "containing" a halogen derivative of napthelens and asphalt is covered in applicants copending case #604,926 on which certain claims have been allowed. Nutting shows a proliminary coating, and Stempol shows the uss of asphalt as a priming coating.

Claims 1, to 12, are open also to this objection, namely to the priming coating in such of these claims is attributed cortain functional capabilites; the secondary coating is defined in more or less precies chomical termonology; (Query), What is the relation in any of these claims betwoon the functional capability of the first coating, and the chemical characteristics of the eccond coating.

In claime 13 to 17, the chemical natur, of the primary coating in characterized by terms more or less broadly definitive, but terms which are responsive to the chemical character of the second coating, hence the objection does not apply.

Claims 18 to 27, inclusive are drawn to the article. The

Edison #679,744.

134

claims are either the subject of division if a different invention or as is more probable,, simply the description of the article father than the process and consequently not patentable over the process claims.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison

INSULATING COATINGS FOR STORAGE BATTERY CONTAINERS AND OTHER ARTICLES

Room No. 308.

Filed February 24, 1912

Serial No. 679,744

HOMORABLE COMMISSIONER OF PATENTS.

SIR:

In response to the Office action of May 8, 1912. The patent to Mutting, 797,702, describes a method of treating wooden bobbins to make them meisture-repellont, which consists in immercing the bobbins in a bath of very thin shellao and thereby impregnating the same. After the surplus shelloo has been permitted to run or drip off and when the bobbins are dry, they are given a final ocating of thick shellac. This patent does not disclose the use of any of the materials employed in applicant's process. The patent to Stempel, 732,663, relates to a method of applying a protective composition which consists in applying powdered aephaltum to the surface to be protectod, fusing the aephaltum, and then applying a protective covcring in a cold state consisting of finely ground mixture of aephaltum, aebostos, and an obstructive material, such as sand, ground etono, pulverized limostone, or kaolin. This patent does not disclose the uso of a material containing a halogen derivative of naphthalene and does not disclose the etep of first applying a coating of adherent material from a colution or of applying a solution composed of an adherent material of asphaltic nature dissolved in a volatile solvent. The Examiner also refers to applicant's copending application Serial No. 604,926, which relates to an insulating compound and the method of making the same. In applicant's co-pending application there is no disclosure of a preliminary coating. The Examiner apparently contomplates combining the patente to Butting and Stempel and applicant'e copending application as an anticipation of claims 1 to 17. The manner in which such patents and application are to be combined for this purpose is not clear. While it is true that in some aspects applicant's present invontion consists in an improved method of using the insulating compound deeoribed in hie copending application and in the improved article resulting from such procees, neither the improved procees nor the new article is disclosed in his copending application, and it is believed that he is entitled to patent protection for his invention.

The Examiner's objection to claims 1 to 12 inclusive, nemely, that to the priming coating in each of those claims is attributed certain functional capabilities while the secondary coating is defined in more or less precise chemical termonology, is not clear. Furthermore, it is not believed that it is necessary to set forth the relation between the "functional capability" of the first coating and the "chemical characteristics" of the second coating. Applicant has invented a new method involving the use of a coating having certain chemical characteristics, and it is believed that the characteristic of the preliminary coating may properly be described in physical terms. The second

coating necessarily has cortain physical proporties by virtue of its chemical characteristics.

The last paragraph of the Office letter is not understood. This paragraph roods as follows:-

"liking 10 to 27 inclinates are drawn to the article. The claims are either the subject of division if a different invention or, as is more probable, stuply the description of the article rather than the process and consequently not patentable over the process claims."

These claims are intended to be descriptive of the article and not of the process, and it is not understood how the Examinor arrives at the conclusion that the article claims are not patentable over the process claims because they are descriptive of the article rather than of the process. On the question of division between the process and the article claims, it is to be noted that the two sets of claims are closely related, and it is believed that they may properly be retained in the same application.

If the Examiner should again reject the claims on the references of record or should repeat any of the objections contained in the Office letter of May 8, 1912, he is requested to state his reasons for such rejection and objections more fully and precisely.

Reconsideration and allowance are requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Llyer His Attorney

Drange, New Jorsey Hey 5th, 1913.

HL-JS

Div. ____15 Room ____308

2-260

Paper No. 4 ...
All communications respecting this steation should give the serial number.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE

Responsive to letter filed May 6, 1913.

The claims are rejected on,

Haarmann #492,197 Peb. 22, 1893 (91-70) in view of applicants allowed once sorial No. 4604,926. It is not believed to involve invention to substitute for the "Amphult Hastic" of this reference, the halogen derivative of maphthalone which is severed in the said allowed case.

Out 1,083,354

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Redform hur. Edin - Dec. 18, 1916

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BYERLEY AND SONS,

"BYERLYTE ASPHALTUM."

CLEVELAND, OHIO, Jan. 18, 1912_

Mr. H.T.Leeming, Purch. Agt., Thomas A. Edison, Inc., Orange, N.J.

Dear Sir:

As per your request of the 16th we are enclosing booklets on Byerlyte are its various uses.

Trusting same will prove interesting, we are

Yours very truly, Byerley & Sons.

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Patent Series Patent Application Files

Folio # 828 Storage Battery Systems

Serial #: 681101

Primary Applicant: Edison, Thomas A

Date Executed: 2/28/1912

Applicant.	Address.
Thomas B. Edison	
Levery Corn	
Let Grange, n.J.	
200 2000	
Title Storagi Battery Rysts	ma.
Filed March 2nd, 1912.	Examiner's Room No. /05
Assignee	The state of the s
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	DOLLIN T DVCD

Counsel,
Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. EDISON a citizen of the United States, residing and having a Post Office address at Llewellyn Perk, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

STORAGE BATTERY SYSTEMS

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Aegistration No. 560), of Orange, New Jersey, his attorney, with full power of substitution and rebocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KHOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Park, West Orange, Essex County, New Jersey, have invented cortain now and useful improvements in STORAGE BATTERY SYSPEMS, of which the following is a description:

My invention relates to electrical systems containing storage batteries, in which the battery charging ourrent is derived from a generator driven by a prime mover liable to fluctuations in speed. My invention is particularly adapted for use upon automobiles driven by internal combustion engines or other motors, and when so used, the generator is driven by the prime mover of the automobilo and is employed to charge a etorage battery when desired, the eaid battory being used to supply ourrent to lighting or other circuits. Among the objects of my invention ie the provision of means for preventing variations beyond predetermined limits in the voltage impressed upon the etorage battery when the same ie being oharged. My invention also comprises a simple and efficient method and meane for supplying ourrent at a substantially conetant voltage to lampe upon a motor driven vehicle. Other objects of my invention will appear hereinafter.

In the drawings which accompany and form a part of this specification, and in which like reference charac-

ters are employed to designate like parts throughout the several views -

Figure 1 is an elevation showing an internal combustion engine provided with apparatus embodying certain features of my invention;

Figure 2 is a view, partly diagrammatic, of a system storage battery/embodying my invention; and

Figure 2 is a view partly in section of one embodiment of my improved means for preventing variations beyond predetermined limits in the voltage impressed upon the storage battery.

Referring to the drawings, an internal combustion engine, which may be used to drive a vehicle, is shown at 1, and an electrical generator suitably supported is shown at $\underline{2}$. The generator $\underline{2}$ is driven from an auxiliary shaft 3 of the internal combustion engine $\underline{1}$ through pulleys $\underline{4}$ and $\underline{5}$ and the bolt $\underline{6}$. The clutch $\underline{7}$, controlled by the rod 8, is provided for clutching and unclutching the pulley 4 to the auxiliary shaft 3. A storage battery 9 is connected to the generator 2 through the switch device 10. The device 10 comprises two slip rings or discs 12 and 13 fixedly secured to the shaft $\underline{11}$ of the generator $\underline{2}$ and insulated from each other by insulating material 14, and from the shaft 11 by an insulating sleave 15. The device 10 comprises also a member 16 of conducting material shown as a disc and fixedly secured to the shaft 11 and insulated thorefrom. Disc 16 is provided with two electrical contacts 17 and 18 insulated from the disc 16 by the insulating bushings 19 and 20 respectively. Centact 17 is connected to the slip ring or disc 12 by the conductor 21 and

the contact $\underline{18}$ is connected to the elip ring or disc $\underline{13}$ Two elongated members 23 and 24, by the conductor 22. of conducting material, are pivotally mounted upon the disc 16 upon conducting studs 25 and 26 respectively. The two members 23 and 24 are approximately parallel to each other, the free end of one being opposite the pivoted end of the other. The two members 23 and 24 are connected by meane of the epring 27 tending to cause the said members to move toward each other. The spring 27 is connected to the momber 23 near its pivot 25 in any suitable manner, as for example, by means of the projection 28. Spring 27 is connocted to the momber 24 near the free end thereof in any suitable manner, as far exemple, by a throaded member 30extended through a projection 29 on the member 24 and having a nut 30', whereby the tension of the spring may be adjusted. The free end of the member 23 is adapted to contact with the contact 17 and the free end of the member 24 is adapted to contact with the contact 18. A back stop 31 is provided to limit the movement of the member 23 away from its contact 17 and towards the member 24, and a back stop 32 is provided to limit the movement of the member 24 away from ite contact 18 and away from the member 23. Brushee 33 and 34 are provided to contact with the slip ringe or discs 12 and 13 respectively. The brush 34 is connected to one terminal of the etorage battery 9 by a conductor 35. The other terminal of the etorage battery 9 is connected to one of the terminal brushes of the generator 2 by the conductor 36. Conductor 36 is provided with ewitch 37 for connecting or disconnecting the charging cirouit to the battery. The other brush terminal of the generator 2 is connected to the brush 35 by the conductor 36. Conductors 39 and 40 lead from the terminals of the storage battery 9 and are adapted to have connocted across them translating devices, such as the lamps 41 and the spark coil 42. A switch 43 is provided for controlling the lamp circuit 41, and a switch 44 is provided for controlling the spark coil circuit.

When it is desired to charge the battery 9, as for example, during the day time when the lamps are not in use, the switch $\underline{43}$ is opened, the switch $\underline{37}$ closed, and the pulley 4 clutched to the suxiliary shaft 3 by means of the clutch $\underline{7}$, which is operated by the rod $\underline{8}$. When the engine 1 is at rest, the pivoted members 23 and 24 have the positions shown in the drawing, and the oirouit from the generator is interrupted at the contact 17. As the engine $\underline{1}$ speeds up, members $\underline{23}$ and $\underline{24}$ tend to move outwardly due to centrifugal action, and the apparatus is so adjusted that at a certain predetermined speed corresponding to the minimum voltage to be applied to the battery, the member 23 makes contact with the contact 17, the member 24 still remaining in contact with the contact 18. The oircuit from the generator $\underline{2}$ may then be traced as follows:- Through the conductor 38, brush 33, slip ring or disc 12, conductor 21, contact 17, pivoted member 23, spring 27 and diso 16, pivoted member 24, contact 18, conductor 22, slip ring or disc 13, brush 34, conductor 35, storage battery 9, conductor 36, and back to the generator $\underline{2}$. When the speed of the engine $\underline{1}$ increases

to such an extent that the voltage of the generator 2 is greater than is desirable to be impressed upon the storage battery 9, the member 24 moves outwardly, breaking the charging circuit at the contact 18. The outward movement of the member 23 at a lower speed than the outward movement of the member 24 may be secured by having the two members 23 and 24 of similar sizs, shape and weight, and the distance between the point of attachment of the spring 27 to the member 23 and its pivot less than the distance between the point of attachment of the spring 27 to the member 24 and its pivot. Instead of providing for breaking the circuit at a predetermined increased speed, the belt 6 may be so arranged as to slip when this speed is reached, due to the increased load upon the generator at the high voltags then generated. When my invention is applied to an automobile, the switch 37 may be kept closed, and the switch 43 opened during the day time when the lights are not needed, and during the night and at all other times when lights are needed, the switch 37 may be opened and the switch 43 closed. In this manner, a source of constant potential is provided for feeding the lights. The spark coil 42 is, however, kept in circuit while the generator is running, the battery 9 tending to steady the voltage across the spark coil 42.

Having now described my invention, what I claim as now and desire to protect by Letters Patent is as follows:- In apparatus of the class described, the combination of a prime mover liable to fluctuations in speed, a generator driven thereby, a storage battery, and meens for maintaining the battery in electrided connection with the generator for speeds of the prime mover within predetermined limits, substantially as described. 589,42

- 2. In apparatus of the class described, a prime mover liable to finctuations in speed, a generator driven thereby, a storage battery, and means for automatically connecting the battery to the generator when the prime mover attains a predetermined speed, substantially as described.
- 3. In apparatus of the class described, a prime mover liable to fluctuations in speed, a generator driven thereby, a storage battery, and means for automatically connecting the battery to the generator at a predetermined speed of the prime mover and for automatically disconnecting the same at a higher speed, substantially as described.
- 4. In apparatus of the class described, a prime mover liable to fluctuations in speed, a generator driven thereby, a storage battery, and centrifugally operated means for automatically connecting the battery to the generator when the prime mover attains a predetermined speed, substantially as described.
- 5. In apparatus of the class described, a prime mover liable to fluctuations in speed, a generator driven thereby, a storage battery, and centrifugally operated

means for connecting the battery to the generator at a predetermined speed of the prize mover and for automatically disconnecting the same at a higher speed, substantially as described.

- 6. In appearates of the class described, a switch comprising a rotatable member, a pair of members pivotally mounted thereon, and resilient meens connecting the two pivotad members, the said means being commended to the said members at different distances from the pivots, substantially as deboribed.
- 7. In apparatus or the class described, a rotatable member, a pair of members pivotally mounted thereon,
 and a spring connecting the two pivoted members and tending to move them toward such other, the said spring being
 connected to the said members at different distances from
 the pivote, substantially as described.
- 8. In apparatus of the class described a switch comprising a rotatable member, a pair of membere parotally mounted thereon, and an electrical contact for each of said members, said members being normally biased, one into contact with its contact and the other out of contact with its contact, substantially as described.
- DA In apparatus of the class described, a variable speed generator, a storage battery, a charging circuit from the generator having therein means for automatically connecting the battery and generator during speeds between predetermined limits, a circuit containing translating devices edapted to be connected to the battery, means for connecting and discommenting said charging circuit to and from the battery, and means for connecting and

disconnecting said translating devices to and from the battery, substantially as described.

7 M. Meens for supplying ourrent at a substantially constant voltage to league upon a motor driven vehicle, comprising a generator driven by the driving motor of the vehicle, a storage battery, means for connecting the storage battery to the generator during periods of non-use of the lamps and at speeds of the motor within predetermined limits, and means for connecting the lamps to the storage battery during other periods, substantially as described.

N. The method of supplying ourrent at a substantially constant voltage to lamps upon a motor driven vehicle, which consists in charging a storage battery from a generator driven by the driving motor of the vehicle during periods of non-use of the lamps and at speeds of the motor between predetermined limits, and supplying current to the lamps from the battery during other periods, substantially as set forth. This specification signed and witnessed this 28th day of Educary 1912—

Thos. A. Edeinn

Witnesseth:

1. Henry Lanahan 2. Anna P. Keehm

Oath.

State of New Jersey Ss., County of Essex

THOMAS A. EJISON , the above manued petitioner, being bully sworm, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, Wost Orango, Essax County, New Jorgey

that he verily believes himself to be the original, first and sole inventor of the improvements in

STORAGE BATTERY SYSTEMS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever fundou or used before his inherition of discodery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his inhention or discodery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said indention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 28th day of thurary 1912

Notary Dublic.

[Seal]

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Paper No. 2......
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DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON

June 21, 1912.

Thomas A. Edison,

C/o Frank L. Dyer.

(40 N 21 1910

Orange, New Jersey.

Please find below a communication from the EXAMINER in charge of your application.
for Storage Battory Systems, filed "arch 2, 1912, Serial Bu.681,101.



The Drawing should indicate the Storage Battery in accordance with the conventional chowing on the draftsman chart opposite page 68, of the Bules of Practice.

The drawing should more clearly indicate that the part 42 represents a swark coil.

Division is required between Chains 1 to 5 incl. sive, 9 and 10 which are drawn to a system of distribution, claims 6, 7 and 8 which covers specifically a centrifugal switch, and claim 11 which is drawn to a method independent of the specific system disclosed.

Further action on the acrits is nostponed until the above requirement shall have been complied with.

A cursory examination fails to disclose a reference for applicants specific system.

Are ex tate King 190 ces 546.

IN THE UNITED STATES PATENT OFFICE

Themas A. Edisen STORAGE BATTERY SYSTEMS Filed March 2nd, 1912 Serial No. 681,101

Reom No. 105.

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of June 21, 1912, please amend the above entitled case as fellows:-

Caneel claims 6, 7 and 8. Renumber claims 9, 10 and 11 as 6, 7 and 8 respectively.

REMARKS

The changes in the drawing required will be made before the application goes to patent.

Claims 6, 7 and 8 have been canceled in partial compliance with the requirement of division. Applicant reserves the right to file a divisional application covering the subject matter of these claims. The Examiner is requested to withdraw the requirement of division between olaim 8, fermorly claim 11, and the remaining claims of the applieation, for the reason that the method set forth in claim 8 is so related to the subject matter of the remaining claims (see particularly claim 7) that it is thought that all ef the claims now submitted may be properly examined in the same application.

Action on the merits is requested.

Respectfully submitted, his attornes

Diy. 26 Room ... 105

5-500

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE
WASHINGTON Details

.... October 13, 1913.....

OCT 13 1918

MAILED

.Frank L. Byer,

.Orange.

Hew. Jorsey ...

Please find below a communication from the EXAMINER in charge of the application of

...Thomas A. Edison, Serial No. 681,101, filed Mar. 2, 1912, for

... Storage ... Battery ... Systems

Commissioner of Pale

In response to amendment of June 20, 1913.

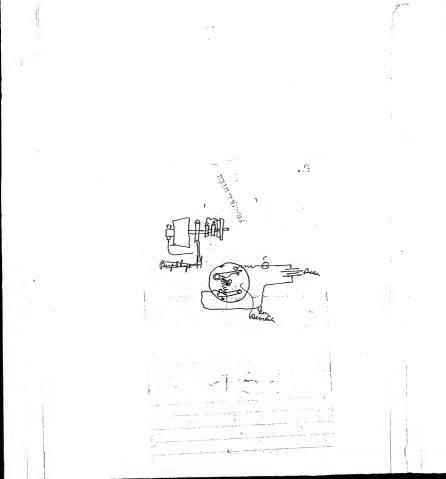
It is not clear in this case why the method and apparatus are so inter-related that they combine in a single invention. Applicant's attention is directed to the decision in <u>re</u> Nolahon, 48 C. G., 286, and <u>in re</u> Fracch, 122 C. G., 1048. The requirement for division between claims 1 to 7 on the one hand and claim 8 on the other hand is repeated and made final.

The following patents are cited:

Bennett, 580,118, Aug. 31, 1897, Systems, Car; and Switches, Automatic, Erben, 787,284, Centrifugal.

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Patent Series Patent Application Files

Folio # 829 Electrical Regulation

Serial #: 685206

Primary Applicant: Edison, Thomas A

Date Executed: 3/8/1912

Applicant.	Address.
Thomas A. Edison	
a	
Title Gelectrical Regula	una.
/	,
Filed march 21 1912.	Examiner's Room No.
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Assignee	
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	ACTIONS.
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1 Office letter Oct. 5	21-1912 16
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16	30
	FRANK L. DYER,

ANK L. DYER,

Counsel,

Orange, New Jersey

Petition.

To the Commissioner of Patents:

Your Petitioner THERAS A. EDISON a citizen of the United States, residing and having a Post Office address at Llowellyn Park, Vost Orango, Essox County, New Jorsey

prays that letters patent may be granted to him for the improvements in

ÉLECTRICAL RECULATION

set forth in the annexed specification; and he hereby appoints Frank L. Wyer (Registration Bo. 560), of Grange, New Fersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therethish.

Uhr. A. Edison_

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:-

BE IT KEOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Ferk, West ... Orange, Essex County, New Jersey, have invented certain now and useful improvements in ELECTRICAL REGULATION, of which the following is a description:

My invention relatos generally to a system of electrical regulation in which a source of ourrent of nonconstant voltage is used to supply current to translating devices requiring constant voltage. My invention is particularly adapted for use in lighting eyeteme where the lampe are fed from eterage batteriee. A storage battery after being charged has an excess voltage at the beginning of the discharge, which is called the "gas voltage", and as the discharge continues, the voltage rapidly falle to the normal rate of discharge, and thereafter drope only elightly and at a uniform rate until the battery is almost completely discharged. My invention comprises sensitive and efficient meane for maintaining a substantially constant voltage on the lamps or other translating devices fed from a storage battery or other source of current. My invention consists also in the details of construction and combinations of elements hereinafter described more fully and olaimed.

In the drawings which accompany and form a pert of this specification, and in which like reference characters are employed to designate like perts throughout the soveral views -

Figure 1 is a diagrammatic view of an electrical system containing an embodiment of my invention;

Figure 2 is a side view, partly in section of a relay adapted for use in my improved system;

Figure 3 is an end view of the same;

Figure 4 is a plan view below the line 4-4 of

Fig. 2, showing the movable contact of the relay and a

portion of its spring support;

Figure 5 is a sectional view of the armsture of the relay taken on the line 5-5 of Figure 2; and

Figures 6 and 7 are side and plan views respectively of an electromagnetic circuit controlling device adapted for use in my improved system.

Referring to the drawings, at 1 is shown a storage battery or other suitable source of ourrent, and at $\underline{2}$ lamps or other translating devices requiring current at substantially constant voltage and designed to be fed with ourrent from the storage battery. The lamps 2 are connected directly across the mains $\underline{3}$ and $\underline{4}$. The main $\underline{4}$ is connected to one terminal of the storage battary, and the other terminal of the storage battery is connected to the main $\underline{3}$ through the conductor $\underline{5}$ and any suitable number of resistances R1, R2, R3, R4 and R5. Each of the resistances $\underline{\text{R1}}$, $\underline{\text{R2}}$, $\underline{\text{R3}}$, $\underline{\text{R4}}$ and $\underline{\text{R5}}$ is provided with a by-pass circuit B1, B2, B3, B4 and B5 respectively. Each of these by-pass circuits contains a stationary contact and a movable contact co-operating therewith, the said contact forming a part of an electromagnetic circuit controlling device, the preferred form of which is illustrated more fully in Figures 6 and 7. Each of these circuit controlling devices comprises an insulating base 10 having mounted thereon an L-shaped support 11, having a horizontal arm secured to the base 10, and a substantially vertical arm which serves to support at right angles to itself a pair of cores of magnetic material 12 and 13 provided with coils 14 and 15 respectively. The two coils 14 and 15 are conneoted in series and so wound that the adjacent ends of the cores 12 and 13 are of unlike polarity. A carbon contact $\underline{16}$ ie mounted upon a support $\underline{17}$. The support $\underline{17}$ consists of an L-shaped member having a horizontal arm adjustably secured to the base 10, and a vertical arm carrying the carbon contact 16. The horizontal arm has a slot 25 therein through which is extended a threaded member 26 heving a nut 27 for securing the support so as to properly adjust the gentact 16 with reference to the contact 19. An armature 18 adapted to co-operate with the magnetic cores 12 and 13 is mounted upon a spring support of conducting material, such as sheet metal, and consisting of an upright portion 20 secured to the vertical arm of the support 11 by a sorew 24, a horizontal portion 21 extending above the coils 14 and 15 and substantially parallel thereto, an upwardly extending loop portion 22, and a downwardly extending portion 23. The armature 18 is mounted on the side of the downwardly extending portion 23, which is adjacent to the cores 12 and 13. Upon the other side of the downwardly extending portion 23, a carbon contact 19 is mounted and is so located as to co-operate with the contact 16. The contacts 16 and 19 are normally in contact, being held in this position by virtue of the elasticity of the spring support of the contact 19.

flexure of the spring support occurs chiefly in the loop portion 22 and in the downwardly extending portion 25, and by virtue of the loop, the flexure is distributed throughout a considerable length of the support, which contributes materially to the durability of the spring support. When the coils 14 and 15 are energized, the armature 18 is attracted by the cores 12 and 13 and the contacts 16 and 19 are separated. The screw 24 which serves to scoure the spring support to the vertical portion of the frame 11 serves also as a means for connecting the contact 19 and its spring support in a circuit. The threaded member 26 is provided with a binding nut 28 for connecting the contact 16 in a circuit. A circuit controlling device, such as is illustrated in Figures 6 and 7, is provided for each of the by-pass circuits Bl., B2, B3, B4 and B5, and these circuit controlling devices are shown diagrammatically at Al, A2, A4 and A5 in Figure 2. In Figure 2, however, each of these devices is shown as provided with a single actuating coil, which is the equivalent of the pair of actuating coils shown in Figures 4 and 5. Each of the by-pass circuits B1, B2, B3, B4 and B5 contains a pair of contacts 16 and 19 which are closed when the actuating ocils of the circuit controlling devices are de-energized; and which are separated when the actuating coils are energized. The actuating coils for each of the circuit controlling devices Al, A2, A3, A4 and A5 are connected in circuit as follows:- One end of each coil (or pair of coils) is connected to a point in the battery through the conductor 5, and the other end of each coil or pair of coils is connected through a conducting wire D1, D2, D3 D4 or D5 to a fixed contact of a relay C1, C2, C3, C4 or C5, ons of which relays is provided for each of the devices Al, A2, A3, A4 and A5 respectively. The preferred form of relay is illustrated in Figures 2 and 3. This relay comprises an D-shaped frame 30 of magnetic material having a herizental arm 60 and a shorter devawardly extending verticel arm 61. The herizontal arm 60 is provided with upward... ly extending projections 32 and 33 by which the relay may be secured to the side of a vertical support, and with downwardly extending oppositely curved pertions 34 and 35 which are adapted to partly encircle and hold in place a coil 36. An armature 37 of magnetic material is extended through the coil 36 and is mounted upon a herizontal pivot 38 attached to the dewnwardly extending arm 61 of the support 30. The armature 37 is made preferably hollow for the sake of lightness and is provided at its free end with a spring sxtsmsien 39 of non-magnetic material carrying a contact 40. The spring extension may be made of thin sheet copper and is preferably looped as at 62 to afferd greater flexibility and also at 63 to afford a convenient means for attaching the centact 40. The centact 40 may be an I-shaped member held in a slot $\underline{64}$ in the upper leeped portion 63 of the spring support 39. The web of the I-shaped centact is slipped into the slot $\underline{64}$ and the two pertions of the loop press against the flanges of tho I-shaped contact and hold the sams in place. A centact mounted in this manner may be easily removed and replaced. The free end of the armsture 37 may be slotted for the reception of the non-centaet-earrying end of the spring support 39, and the latter may be soldered or otherwise

secured in the slots. A contact 41 is provided in the horizontal portion 60 of the frame 30 and is located vertically above the contact 40 and adapted to contact therewith when the armature ie in its upper or raised position. Contact 41 is insulated from the frame 30, and is carried by a threaded member 63 and looked in place by the nut 42. The threaded member 63 ie provided with washere 44 and a nut 43 for connecting the contact 41 to a circuit. In the construction illustrated and described there is a elight rubbing between the contacte 40 and 41 whenever the circuit is made or broken, and the faces of the contacte are kept clean thereby. Armature 37 is also provided at ite free end with a rod 45 of non-magnetic material, such ae brace, extending therefrom and soldered or otherwise ecoured thereto. A weight 46 preferably of non-magnetic material, such as brass, is elidably mounted on the rod 45and is provided with a set sorew 65 for ecouring the weight in adjusted position. The circuit containing the contact 41 extends through the contact 40, when the latter ie in closed position, the epring support 39, the armature 37, and the conductor 47, which may be soldered to the armature 37 preferably near its pivotal support. As a part of the magnetic circuit of the relay, a screw threaded member 48 of magnetic material is extended downwardly through the horizontal portion 60 of the frame 30 at the free end of the armature 37. The member 48 hae a knurled head 48' to facilitate adjustment of the same. The member 48 has extended through it a screw threaded member 50 of non-magnetic material, the lower end of which serves as a stop to limit the upward movement of the armature 37, and to prevent the armature 37 from coming in

contact with the member 48 which would be liable to cause sticking. A nut 49 threaded upon the member 48 serves to look the same in adjusted position, and the nut 51 threaded upon the member 50 serves to look it in adjusted position. In order to limit the downward movement of the armsture $\frac{37}{r}$ a stop 52 is provided consisting of a throaded momber extended vertically through the horizontal portion of a nonmsgnetic bracket 51 secured to the horizontal portion 60 of the frame 30 and having downwardly and horizontally extended portions. A nut 53 is provided for looking the stop 52 in adjusted position. The relay is capable of boing so adjusted that for a predetormined strength of ourront through the coil 36, the armature 37 moves into its upper or raised position and the contacts 40 and 41 are closed, and when the strength of current decreases to a cortain predetormined extent, the armature 37 drops into its lower position, due to its own gravity and that of the weight 46, and the circuit is opened at the contacts 40 and 41. The rolay is adjusted to close the circuit for a predetermined strongth of ourrent and to opon the circuit for a prodetermined leaser strength of current chiefly by means of the adjustable weight 46, and to a less dogree by the stops 50 and 52, and the adjustable portion 48 of the magnetic circuit. By screwing the magnetic member 48 into a position so that the gap between the free end of the armature 37 and the lower end of the member of magnetic material 48 is doorossed, the armsture will be moved into its upward position for a smaller current strength in the coil 36, and vice versa. By moving the weight 46 away from or

towards the free end of the armature, the armature may be caused to drop into its lower position for a lesser or greater current in the coil 36. Purthermore, upward adjustment of the etcp 52 tends to cause the armature to move upward for a less current strength, and downward movement of the etcp 50 tends to cause the armature to drop into its lower position at a greater current etrength.

Referring (again) to Figure 2 of the drawings, the pivoted end of each of the armatures of the relays C1, C2, C3, C4 and C5 is connected to an intermediate point of the battery other than that to which the conductor $\underline{\mathbf{5}}$ is connected, by a conductor 29, and the actuating soils 36are connected in any suitable manner, as for example, all in parallel, or all in series, or in series-parallel, acrose the terminale of the battery 1, so that the current etrongth in each of the coile 36 varies as the voltage of the battory 2 varioe. The relays are so adjusted that for the maximum voltage of the battery $\underline{1}$, i.e., when the battery has its maximum "gas voltage", the contacts 40 and 41 of the relaye 61, 02, 03, 04 and 05 are closed. For thie condition of affaire the actuating coile of the circuit controlling devices Al, A2, A3, A4 and A5 are all energized and the by-pase circuits B1, B2, B3, B4 and B5 are all broken, and consequently, all of the recietances R1, R2, $\underline{R3}$, $\underline{R4}$ and $\underline{R5}$ are in circuit with the lampe. Those reeletancee have such values as to reduce the voltage to the required voltage for the lempe $\underline{\mathbf{z}}$. As the battery voltage drope to a predetermined value during discharge, the circuit of the relay $\underline{\text{C1}}$ ie opened at the contacte 40 and 41, causing the actuating coil of the circuit controlling device Al to be de-energized and the by-pass cirouit B1 for the resistance R1 to be closed, thus outting the resistance R1 out of circuit with the lamps. The remaining resistances have such values as to cause the proper voltage to be impressed upon the lamps. As the battery voltage drope still further, the relays C2, C3, $\underline{\text{C4}}$ and $\underline{\text{C5}}$ have their contacte successively opened, the actuating coile of the devices AZ, A3, A4 and A5 are sucosseively de-energized, the by-pass circuits B2, B3, B4 and B5 are successively closed, and the resistances R2, R5, R4 and R5 are successively out out of circuit, maintaining the substantially constant required voltage, /leaving the lampe connected directly to the battery. The relaye are so regulated that when the minimum voltage at which the battery is used to supply the lampe is reached, all of the recistances are out out.

The relays C1, C2, C3, C4 and C5 may be adjusted to open the circuits of the devince A1, A2, A3, A4 and A5 at ouncessively lower voltage of the battery by properly adjusting the weighte 46 of the relaye, the end weighte being located at different distances from the free ende of the armatures, the said distance being greatest in the relay C1, and the distances becoming ouncessively smaller in the relays C2, C3, C4 and C5.

Having now described my invention, what I claim as new therein and desire to protect by Lettere Patent is as follows:-

1. In a system of the class described, the combination of a source of current, translating devices fed therefrom, a plurality of resistances connected in circuit between the source of current and the translating devices, and means responsive to changes in voltage of the source of current for short-circuiting one or more of said resistances, substantially as described.

- A 2. In a system of the class described, the combination of a storage battery, lamps fod thoroby, a plurality of resistances connected in circuit between the battery and the lamps, circuit controlling devices for the resistances, and relays for the circuit controlling devices, unbetantially as described.
- c 3. In appearatus of the class described, a frame of magnetic material, an armature pivotally mounted thereon, a coil supported by the frame and surrounding the armature, said frame being provided with an adjustable portion of magnetic material forming a part of the magnetic circuit, substantially as described.
- A 4. In a system of the class described, a variable voltage source of ourrent, a relay having a coil carrying ourrent proportional to the voltage of the source, and a movable element, the position of which is dependent upon the voltage of the source, substantially as described.

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A 5. In a system of the class described, a variable voltage source of ourrent, translating devices fed thereby, a resistance in circuit with the source and said devices, a by-pass circuit for the resistance, and means responsive to the voltage of the source for controlling the by-pass circuit, substantially as described.

- c. 6. In apparatus of the class described, a contact, a coil, a pivoted armature actuated thereby, a contact carried on the free end thereof, and adjustable means for causing the contacts the move into circuit closing position for predetermined current strengths in the coil, substantially as described.
- C. 7. In apparatue of the class described, a frame of magnetic material, an armsture pivoted thereto, a member of magnetic material carried by the frame and adjustable with respect to the free end of the armsture, and an adjustable member of non-magnetic material carried by the member of magnetic material and constituting a stop for the armsture, substantially as described.

292

- A 8. In a system of the class described, a variable voltage source of current, translating devices fed thereby, a plurality of resistances in circuit with the source and enid devices, each of said resistances being provided with a by-pase circuit, and meane responsive to the voltage of the source for controlling the by-pass circuits, substantially as described.
- 9. In apparatus of the class described, an electrosagnet having an armature, a looped spring support carrying the armature, a emporting frame to which the electromagnet and looped epring support are secured, a contact fixedly secured to the armature, and an adjustable stationary contact co-operating therewith, substantially as desorthed.

- C 10. In apparatus of the class described, a frame of magnetic material, an armature pivotally mounted thereon, a coil surrounding the armature, and an adjustable weight for the armature whereby the apparatus may be so adjusted that movement of the armature will occur for a predetermined strength of current in the coil, substantially as described.
- 11. In apparatus of the class described, a frame of magnetic material having an adjustable portion, a pivotally mounted armature, a coil, the said frame and armature forming a magnetic circuit for the coil, an adjustable weight for the armature, a stationary content, and a content oc-operating therewith and carried by the armature, substantially as described.
- 12. In appearatus of the class described, a frame of magnetic material having an adjustable portion, a pivotally mounted armsture, a coil, the said frame and armsture forming a magnetic circuit for the coil, an adjustable weight for the armsture, adjustable stops for the armsture, astationary contact, and a contact co-operating therewith and carried by the armsture, substantially as described.

This specification signed and witnessed this 8th day of hearth 1912 J. Las. I. Edison

Wlitnesseth:

1. Henry Lansham 2. Arma P. Klehm

Oath.

State of New Jersey | 88. County of Essex

, the above named THOMAS A. EDISON petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orango, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improvements in

MIRCURICAL RECULATION

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the Einited States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the Chuted States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Soworn to and subscribed before me this 8th day of March 1912

Anna P. Keehn

[Seal]

Fig. 1 1992

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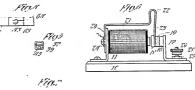
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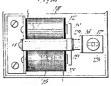
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Witnesses:

T

Inventor:

429 685,206

Inventor:

Y 121

Div. 26 Room 108

VCO

Paper No. 2.....
All communications respecting this pitcation should give the serial number.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

October 21, 1912.

Thomas A. Edison,

c/c Frank L. Dyer,

Orange, N. J.

OGT SI 1919

Please find below a communication from the EXAMINER in charge of your application. for Electrical Regulation, filed Mar. 21, 1912, Berial No. 685,206.



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o 0-0531

Page 8, line 8, "2" should be 1.

Page 9, line 19, "voltage" should be voltages.

Prior to action on the nerits division is required between claims 1, 2, 4, 5 and 8, which cover a system of voltage regulation, and claims 3, 6, 7 and 9, which cover a specific type of electromagnetic switch capable of general application.

Division is also required between the switch claims, since claim 9 is specific to the medification chown in Fig. 9, whereas claims 5, 6, 7 and 10 are specific to the medification shown in Fig. 2.

The following references are cited to assist applicant in

iividing:-	/				
Drum, Skeen, Vinger, Olarke, Outler, French patent to Fauset, Creveling, Bliss, Curris, Ourris, Sprong,	953, 404, 966, 526, 1,006, 631, 653, 472, 377, 426, 644, 409, 572, 527, 401, 332,	Aug. 9, Mar. 29, Aug. 9, Aug. 24, July 10, Sep. 6, Feb. 27, Dec. 8, Apr. 16,	1898, 1910, 1910, 1911, 1900, 1907, 1900, 1896, 1889,	Byetens, Regulator Bwitches,	Resistance;

Div. 26 Room 105

44-201

9-960

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

....

WASHINGTON May 16, 1913.

Frank L. Dyer, MAY 16 1913

Oxenge, MAY 16 1913

MAILLO.

Picase find below a communication from the EXAMINER in charge of the application of Thomas A. Edison, Serial No. 685,206, filed Mar. 21, 1912, for Electrical Regulation.

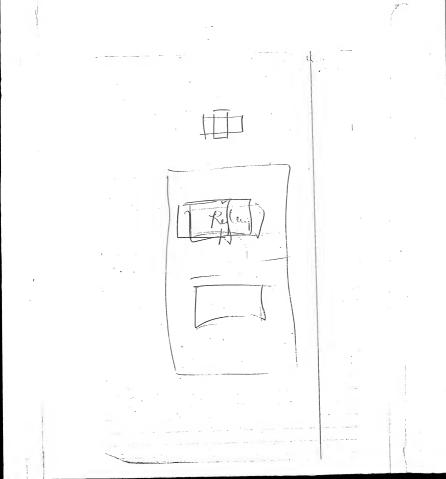
Commissioner of Polente.

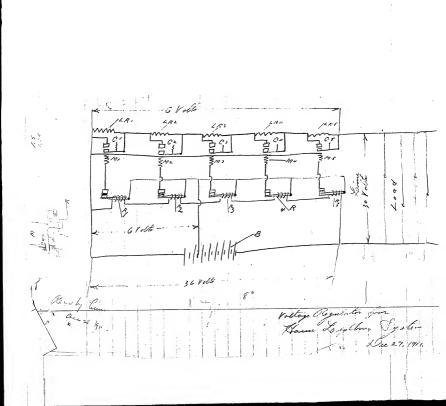
In view of a probable interference, applicant is required to recopond to the requirement for division made in the Office action $\frac{1}{L}(f, | R|^2 - f^2)$ within thirty days, or on or before June 16, 1913, making an election as to the invention to be prosecuted in this case.

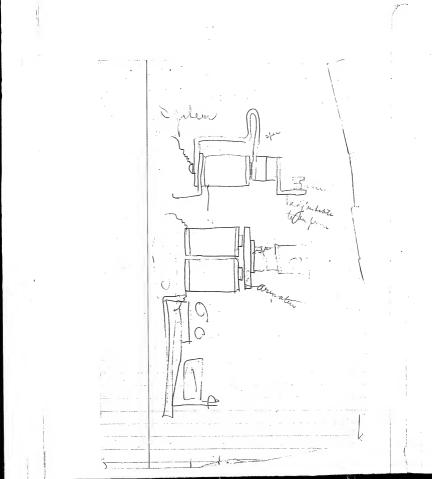
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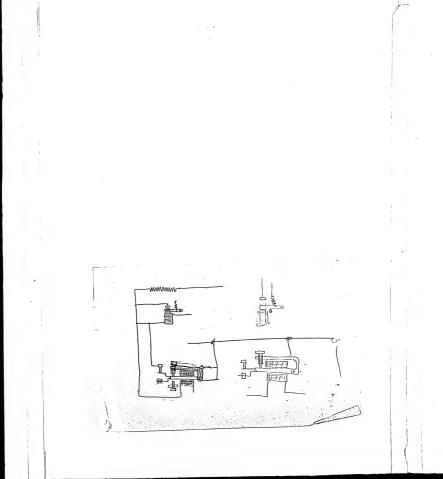
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Dec 22, 1911. Ohors in of Vallage Regulation Battery commists of 24 Sela : when fully charged terminal G.M. T. in 36 Valle. I'me or more relayer are committed across the bathery as show The circuits Unough M1-2-3-0-5 are prefit closed as long as gas vollage herfing of 36 % halding cut autespen herfing on consuit When battery voltage duto to 35 Tome Vollage dhape to 29. Pelay Ost in adjusting to open other circul Manyle MI when battery vollage drops to 35; 61 closes cutting and resistance Lo. R. 1 raising Lemin Vallag to 30 When balley wollage shots to 34 Line ballage show to 29, M2, 62 down cutting out Lo. B2 raining Sime bollage to 30 Turation continues until all Some resessance is colour









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Patent Series

Patent Application Files

Folio # 831 Motor Vehicles

Serial #: 685542

Primary Applicant: Edison, Thomas A

Date Executed: 3/8/1912

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	FRANK L. DYER,
light 1	Counsel,
50 K. Sa. 18	Orange, New Jersey.

Petition.

To the Commissioner of Patents:

Pour Petitioner THOMAS A. EDISON a citizen of the United States, residing and having a Post Office address at Llewellyn Park, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

MOTOR VEHICLES

set forth in the annexed specification; and he hereby appoints Frank L. Dyer (Registration Lo. 560), of Orange, New Jersey, his attorney, with full power of substitution and rebocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Thos. A. Edison

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of Llewellyn Fark, west Orange, Essex County, New Jersey, have invented certain new and useful improvements in MOTOR VEHICLES, of which the following is a specification:-

My invention relates generally to motor vehicles and more particularly to improvements in the running gear of such vehicles, whereby the construction of the same is facilitated and its durability is increased. One feature of my invention is a motor supporting frame adapted to be roadily attached to the exles of vehicles of ordinary construction, and another feature is the provision of oushioning or shock-absorbing means for the motor and metal parts of the frame, so as to prevent crystallization of such parts, due to shooks, and consequent fracturing. As a cushioning means, I prefer to use non-metallic elastic material, preferably fabric, such as felt-like material, canvas, or rubberisod fabric. In my improved structure, the motor supporting frame is separated from the axles at all points by cushioning material, and the motor is separated from the frame by similar material. In this way the metal parts of the frame and particularly the motor are protected from shocks received by the whoels and axles. My invention inoludes also means for reinforcing and strengthening the vehicle structure. My invention consists furthermore in the combinations of parts and details of construction hereinafter described more fully and claimed.

In the drawings which accompany and form a part of this specification, and in which like reference characters are employed to designate like parts throughout the several views -

Figure 1 is a plan view of a motor vehicle embodying my invention with the body removed; Figure 2 is a vertical section on the line 2-2

of Figure 1;

Pigure 3 is an enlarged vertical section on the
line 3-3 of Figure 1; and

Figure 4 is a vortical elevation showing a portion of the roar axle of the vehicle and means for attaching the frame thorsto.

Referring to the drawings, at 10 and 11 respectively ere shown front and rear axles of a vehicle of ordinary construction. The front axle 10 includes an iron or stoel portion 12 and a wooden stiffening momber 13, and the rear axle 11 includes an iron or steel portion 14 and a wooden stiffening portion 15. The front vehicle wheels are shown at 16 and 17, and the rear vehicle wheels at 18 and 19. Means for steering the vehicle is shown at 20.

The frame for coupling together the front and rear axios and for supporting the motor consists of side members 21 and 22 and cross members 23. 24 and 25, all of fract, and of the side members 21 and 22 are bent inwardly and connected together at their forward ends by being riveted or wolded to a member 26, which is preferably an iron or steel cesting. The ends of the cross member 23 are secured to the

eide members 21 and 22 near their rear ends, but in front of the rear axle, by riveting or welding. The ends of the cross members 24 and 25 respectively are secured to the eide members 21 and 22 intermediate the ends thereof. The main portion of the frame consists of the side members 21 and 22 and the cross members 23, 24 and 25. Additional stiffening and reinforcing members may be provided, such as the member 58, which connects the members 25 and 21. A block 27, preferably of iron or steel, is secured to the under side of the central portion of the front axle 10 by clips 28. The block 27 has a horizontal opening therethrough extending at right angles to the axle, and in the opening a bushing 29 is secured. A horizontal pin or bolt 30 is extended through the member $\underline{26}$ and the block $\underline{27}$ and serves to connect the frame to the front axle. A nut 31 and washers 32 are provided for the belt. By this construction, the axle has freedom of movement relative to the frame around the exis of the bolt, and strains in the frame structure due to inequalities in the roadway are avoided. Elastic material 33, such as felt-like material, canvas, or rubberized fabric, is placed between the metal block 27 and the iron or steel axle 12, and between the cross pieces 34 of the clips 28 and the wooden portion 13 of the axle, in order to prevent orystallization of the metal parts due to the shocks to which they are continually subjected when the vohicle is in use. Such crystallization is liable to cause fracture of the parts.

In order to secure the frame to the rear axle, the following construction is employed:- A member 40, wreferably an iron or steel casting, is provided for each

of the rear ends of the side members 21 and 22. the eastings 40 is adapted to be secured in place under the rear axle by clips 41, 42 and 43. The clip 41 passes under and in engagement with an extension 44 of the cesting. The extension $\underline{44}$ is parallel to the axle and has a groove in its under side for the reception of the olip 41. The clip 43 passes over the wooden portion 15 of the rear axle and is streaded into luge 45 integral with the oasting 40. The clip 43 has nuts 46 for securing the casting in place. Each casting 40 has an opening therethrough which is preferably rectangular and extends at right angles to the rear axle. The rear end of one of the side members 21 and 22 is extended through the opening of each casting. In Figure 4 the rear end of the side member 22 is shown extended through the opening, and the rear end of the side member 22 may be reinforced by a piece of the same shape and material riveted thereto, as shown in this figure. A block of metal 47 is also extend od through the opening and assists in holding the side member 22 in place. The block 47 rests on the bottom of the rectangular opening of the casting 40. On the top of the block elastic material 48 of the character hereinbefore described is placed to prevent crystallization in the metal parts due to shooks. The horizontal flange of tho angle-shaped side member 22 rosts on the elastic material 48, and the vertical flange extends between the side of the block 47 and a vertical wall of the rectangular opening in the casting 40. Upon the horizontal flange of the side member 22 is placed elastic material 49 of the character hereinbefore described. Bearing members 50 and 51 rest upon the elastic material 49, and clips 52 and 53 pass over the bearing members and around the side member 22 and blook 47, and are eccured by nuts to rearwardly and forwardly extending lugs 54 and 55 integral with the casting $\underline{40}$. The side member $\underline{22}$ is secured in the casting $\underline{40}$ by the clipe 52 and 53, and the side member 21 is secured in its casting in a similar mannor. The clip 42 oxtends around the bottom of the easting 40 in a groove therein and passes through openings in the horizontal flange of the eide member $\underline{22}$. The clips $\underline{41}$ and $\underline{42}$ are sooured by nuts in the bearing member 56 resting upon the lower sheaf of epringe 57. Thue, the slaps 41 and 42 serve to secure the rear springs and axle togethor as well as aiding to clamp the frame in place. The clip 42 is put in place after the rear end of the eide momber 22 has been extended through the opening in the casting $\underline{40}$. The structure for connecting the rear end of the eide member 21 to the rear axle is the same as that for connecting the rear end of the side member 22 to the axle.

Upon the frame is mounted an electric motor $\frac{60}{50}$ by means of brackets $\frac{61}{51}$ and $\frac{62}{51}$ attached to the cross members $\frac{23}{51}$ and $\frac{62}{51}$. Cushions of elactic material $\frac{39}{51}$ of the character hereinbefore described coparate the brackets $\frac{61}{51}$ and $\frac{62}{51}$ from the cross members $\frac{25}{51}$ and $\frac{64}{51}$. A counterchaft $\frac{63}{51}$ is also mounted on the brackets $\frac{65}{51}$, $\frac{36}{51}$ and $\frac{37}{51}$ secured to the frame so as to be adjustable in position to regulate the tension of the ohain drives $\frac{64}{514}$ and $\frac{65}{51}$. The Facket $\frac{26}{51}$ is mounted on a member $\frac{32}{51}$ connecting the cross

members 24 and 25. Outshions of elastic material 38 of the character hereinbefore described separate the brankets 35, 36 and 37 from the frame at all points. Power from the motor is transmitted from the motor through the chain drives 64 and 65 to the rear wheels 16 and 19.

Reinforcing means for strengthening the front axis may be provided, consisting of a tension rod 70 having its ends secured to lugs 71 which are attached by serems or bolts 72 to the forward side of the front exte 10 at points substantially equidistant from the middle of the axio, the said red extending in a groove around the forward face of a thrust block 73 which is located between the front pertions of the clips 20 and held against lateral movement thereby. The block 73 is pressed against the iron portion 12 of the front exte by the tension of the red 70. This reinforcing means serves to strengthen the front exte against shocks produced by obstanles encountered in the readway by the front wheels in the forward movement of the vehicle.

As an additional stiffening means for the structure, I may provide a pair of tension rode <u>75</u> extending from the front portion of the vehicle to the roar axle. Each of the rode <u>75</u> is secured at its forward end to a plate <u>76</u> held between a block <u>78</u> on the front spring end the vehicle body <u>79</u> by bolts <u>77</u>, and is secured to the roar axle by a plate <u>80</u> sedured to the under side of the roar axle by clips <u>81</u>. A turn buckle <u>82</u> may be provided in each of the road <u>75</u> for adjusting its tension. In this manner

the structure is stiffened and strengthened sgeinst shocks due to inequalities in the readway and to starting and stopping the vehicle. Purthermore, the tension rode to permit the front axle to turn about the pin or belt 30 without disforting the structure.

Having now described my invention, what I claim and desire to scoure by Letters Patent of the United States is as follows:-

- 1. In a motor vehicle, a unitary motor-supporting and aclo-coupling from addited to be secured to the front and roor aclos of a vehicle, substantially as described.
- 2. In a motor vehicle, a unitary motor-supporting and axle-coupling freme of iron or steel adapted to be secured to the front end rear exles of a vehicle, substantially as described.
- 3. In a motor vehicle, a unitary motor-supporting and axle-coupling frame adopted to be sourced to the front end roor axles of a vehicle, and means for readily securing the frame to the soid exles, supportantially as desortbed.
- 4. In a motor vehicle, a unitary motor-experiting and axlo-coupling frame (of iron or steel adapted to be secured to the front and roar axles of a vehicle, and means for restily securing the frame to the said axles, aubstantially as described.

- 5. In a motor vehicle, a unitary motor-supporting and exlectioning frame, and means for scouring the frame in fixed relation to the roar axle and in movable relation to the front axle, substantially as described.
- In a motor vehicle, a unitary motor-supporting and ealse-coupling frame of iron oracleol, and means for securing the frame in fixed relation to the rear sale and in movable relation to the front axle, substantially as described.
- A. In a motor vehicle, a metor-emporting and axle-coupling frame of mitallia members and schepted to be secured to the front and year axles of Avenicae, and non-metallic oushioning means for reducing the tendency corystellization of the said members due to shooks, substantially as described.
- 2 B. In a motor vehicle, trues secured to the cales of the vehicle and separated therefrom, by non-metallic elastic material, and a motor and power transmitting mechanism mounted on the frame on separated therefrom by non-metallic elastic material, substantially as described.
- A. In a motor vehicle, a frunk secured to the axios of the vehicle and separated therefrom by clustic the rio, and a motor and power transmitting modalnism mounted on the frame and separated therefrom by clastic fabric, substantially as described.

To in a motor vehicle, reinforcing means for the axle comprising a threst block located substantially at the middle of the forward side of the soile, a tension rod extended over the forward side of the block, and means

Conserve 219/11

for securing the ends of the tension rod to the axle, substantially as described.

al. In a motor vehicle, reinferring means for the exte comprising a thrust blook loasted nubstantially at the middle of the forward side of the axle, a tension reactended over the forward side of the blook, and lugs secured to the ends of the tension red and to the axle, substantially as described.

As. In a motor vohicle, the combination of front and rose axios, extends corrida thereby, a frame connecting the exlem, and tension rode, ascured to the rose axio and to forward portion of the desired above the front spring. In the control of the desired above the front spring.

In a notor vohicle, the combination of front of the combination of the combination of the front of the front on the combination of the com

In a motor vehicle, the combination of front "Inby" and rear exice, operance and a body mounted thorson, a frome fixedly seemed to the corr exic and nivotally scenared to from exic, and tension rodg, connecting the rear exic with the forward part of the body, substantially as described.

Inscitate Carme 7,8, 9 and 10 5/1/2 Insuit BD " 627 7/15/14 This specification signed and witnessed this 5th day of march 1912

Thos. R. Edium

Wlituesseth:

1. Tenny Lanahan 2. Prima P. Klehm

Oath.

State of New Jersey \ ss.. County of Essex

, the above named THOMAS A. EDISON petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex County, New Jersoy

that he verily believes himself to be the original, first and sole inventor of the improbements in

MOTOR VEHICLES

described and claimed in the annexed specification; that he does not know and boes not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this 7th day of Franch 1912

Rotary Bublic.

[Seal]

Lis Ally.

4°

235 Address colo

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

831

May 22, 1912. U. S. PATENT OFFICE.

Thomas A. Edison,

care Frank L. Dyer,

MAY 22 . 112

Orange, N. J.

JIV. X. MAILEL

Please find below a communication from the EXAMINER in charge of your application.

for Notor Vehicles, filed March 22, 1912, #685,542.

EBMsore!

/ Page 3, line 16, bolt is misspelled. Is clip 43 "threaded" into lugs 45, as stated on page 4, lines 7 and 879

The reference numeral 37 is used at bottom of page 5, and on the drawing to designate two unlike parts.

The following references are cited:

Millard, 712,839, Nov. 4, 1902, Motor Vehicles, Greuter, 687,744, Dec. 5, 1901, Pearson, 641,404, Fan, 16, 1900, Glark, 672,030, April 16, 1901, Lockmoda) 508,797,001, 6, 1998, (X) Meter Vehicles, (Electrics)

Claims 1 to 8, inclusive, are rejected on Millard, cited. The frame C carrying the motor is connected to the front and rear axles with rubber cushions interposed between said axles and frame.

Claim 9 is not patentable over Millard, takon with Clark.

The former patent shows the resiliently supported frame, and the latter patent the resiliently supported motor. To combine these two supports for the motor would produce no new or different result and would not involve invention.

The patent to Lookwood, citod, shows that it is not unusual in the art to place oushions between the motor and its supporting Claims 10 and 11 are not thought to be patentable over Millard. It is not seen that there would be invention in placing the truss brace h on the front side of the axle if the axle required

a brace in this position. Claims 12, 13, and 14 are rejected on Pearson, cited.

IN THE UNITED STATES PATRIT OFFICE.

THOMAS A. EDISON, MOTOR VEHICLES, Room No. 235. Filed March 22, 1912, Serial No. 685,542. HOHORABLE COMMISSIONER OF PATERIES, SIR: In response to the Office action of May 22, 1912, please amond the above entitled case as follows: Page 2, line 25, cancel "Each" and insert _ Both - . Page 3, line 16, change "bolt" to - bolt - . Page 4, line 8, cancel "threaded inte" and insert - secured to - . Page 5, line 13, change "slips" to - clips -; seme page, last line, change "37" to - 36a - .. Page 7, line 3, change "82" to - 75 - . Claim 7, line 2, cancel "and adapted to be", line 3, change "a" to - the - , and after "and" second occurrence, inport - peparated therefrom at all points by -]. Claims 8 and 9, line 2, after "therefrom" insort - at all points- . Claim 12, line 3, and claim 14, line 4, after "reds" insert - directly - . Claim 13, line 4, after "red" insert - direct-1y - · Cancel claims 1 to 5 and 10 and 11. Renumber claims 7, 8, 9, 12, 13 and 14 as 1 to 6.

Canceled 1/15/14

- 7. In a motol vehicle, a frame accurat to the axles of the vehicle, and a poter and power transmitting mechanism mounted on the frame and separated therefrom by non-metallic elactic material, substantially as described.
- 8. In a motor vohice, a frume secured to the axlos of the vohice, and a motor and power transmitting mechanism mounted on the frume and separated therefrom by clautic fabric, substantially as described.
- In a motor vehicle, the combination of front and rour cales, springe, and a body mounted thereon, a frame fixelly meatred to the rear axia and having a wingle horizontal pivotal connection with the front sale and a tension red directly commecting the rear axia with the forward part of the body, substantially as described.
- 19. In a motor vohicle, the combination of front and rour axles, upringu, and a bedy mounted theorem, a frame fixedly accurate to the roar axle and having a single horizontal pivotal connection with the front axle, and tencion read directly connecting the roar exle with the forward part of the body, substantially as described.

RRMARKS

The Examiner is requested to kindly change reference character 37 designating the member on which bracket 36 is mounted to 36a.

Applicant is aware that it is customary to mount the meter of a vehicle upon the vehicle frame by means of metallic oprings as shown in the references Clark and Lockwood. While such a mounting is doubtloss advantageous in that the motor will be prevented from partaking of all the jolts and other movements of the vehicle frame resulting from unevenness in the readway, I have discovered that, where the connections between motallic structures, such as the axles and frame and the frame and motor of a vohicle are of metal, even when those connections take the form of oprings, the shocks received by the wheels and axles of the vehicle act through the motal connections to cause molecular displacement of the material of the frame and motor and result, in the crystallization of the parts and consequent fracture. In my improved structure, the motor supporting frame is separated from the exles at all points by nonmetallic oushioning material such as canvas or rubberised febrio, and the motor is separated from the frame by similar material. While Millers discloses enchioning means betwoon the frame C and the front and rear axles, he also discloses rigid connections N between the frame C and the roer axlo, which connections are entirely of metal. Consequently, checks received by the rear axle of Millard's vehicle would be communicated through the connections I to the frame C and cause crystallization of the latter. Moreover, Millard provides no cushioning means between the motor and the axle coupling frame C. Nor does any of the references disclose non-metallic cushioning means between the motor and the vehicle frame. By the omployment of non-metallic cushioning means between the axles of the vohicle and the axle coupling frame and between the axle coupling frame and the motor, applicant does produce a new and useful result, namely, the prevention of crystallization of the parts of the axlo coupling frame and the motor which would otherwise result from

the shocksreceived by the axlos of the vehicle.

Claims 1, 2 and 3 specify that the frume secured to the front and rear axles of the volidle is separated at all points therefrom by non-matallic onebhoning means or clastic fabric. Claims 2 and 3 also specify, as do new claims 7 and 8, that the motor and power transmitting mechanism is mounted on the frame secured to the axles of the volicle and is separated therefrom by non-motallic clastic material or by clastic fabric.

Claims 4, 5, 6, 9 and 10 specify that a tension rod or tonsion rods are directly accound to the rear axlo and to the forward part of the vehicle or body. In Poarson's device, the trues rods P are not directly connected to the rear axle, but are connected at one and to the body of the vehicle and at the other and to the body of the vehicle and at the other ond to the axle coupling frame C. Rods P, therefore, will impose stress on the axle coupling frame C, whereas in applicant's device, the tension rods rolleve the axle coupling frame from more ar less strain to which the frame would otherwise by subjected by shocks due to inequalities in the readway and to the starting and stopping of the vehicle, and divide the strain between the vehicle body and the rear axle.

Olains 5, 6, 9 and 10 further specify that the frome secured to the rear axle is pivetally secured to the front axle or has a single herisontal pivotal connection therewith. The connection of the tension red or reds with the vehicle body and the rear axle in the construction called for by these claims persit the front axle to turn freely about its pivotal connection with the axle coupling freese without distorting the latter, which well not be the case in the construction disclosed by Poerson. It is

obvious that by the arrangement of the tension red or reds as set forth in claims 5, 6, 9 and 10, the extecoupling frame may be made much lighter than would be messeary in Pearson's device to secure the same degree of shifety.

For the above reasons, further consideration and allowance of the claims as now presented are recuested.

Respectfully submitted,

THOMAS A. EDISON,

By Chark L. Dugar his attorney.

Orange, New Jorsey,

May 9

Div. X... Room ... 235

2-200

Paper No. 4..........
All communications respecting this plication about give the serial number, date of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON July 17, 1913.....

	U. S. PATENT OFFICE,
Frank L. Dyor,	JUL 17 1913
Orange, N. J.	MAILED.
Please find below a communication from the EXAMINER i	
Thomas A. Edison, for Motor Vehicles, fi	led March 22, 1912,
#685,042,	
	SMIsore!
c 6-953	Commissioner of Polents.

Amended May 10, 1913.

The following additional references are cited:

2009 January 25, 1908, lictor Vehicles,

Gautier, 8004, (lat Add. to 370,367), Jan. 8,

1908, Motor Vehicles, (Frames).

Chaim I is rejected on Millard of records. The mere fact that the patentee pivote holts a⁰ to the bands F, G, and secures these bolts to the axle, does not interfere with the function of the rubber blocks z. It is not seen how applicant can ineist on such a distinction whon his own device shows a metallic contact between the edd of the exce and block 27.

Glaims 2, 3, 7, and 8 are rejected on Millard, in view of French patent to Gautior. The latter patent shows <u>rubber</u> ouehions between the motor frame and the main frame, while Hillard shows the cushions between the axles and main frame. It is not seen that any invention is involved in mounting a motor on the Millard frame with cushions between the motor and frame in view of Gautier.

Olaims 4, 5, and 6 are not considered patentable over Pearson of coord. It is not believed that there is invention in connecting rods P to the rear axle instead of to the frame C near the

#685.542----2.

axic. The frame C is braced by rode 05, and it is not thought the function of the device would not be materially different whether the braces P are attached directly to the axic or to the frame in proximity to the axic. The frame C is pivoted to one of the axics as called for in claims 5 and 6.

Exr. Div. X.

IN THE UNITED STATES PATENT OFFICE

THOMAS A. EDISON,
MOTOR VEHICLES,
Filed Murch 22, 1912,
Sorial No. 666,542

HONORABLE COMMISSIONER OF PATENTS.

SIR:

In response to the Office action of July 17, 1915, please amend the above entitled case as follows: Glaim 4,1ine 2, cancol "springs" and insert - a body -; line 4, cancel "vehicle" and insert - body -.

Claim 5, lino 2, cenoel "springs and "; line 3, cencel "spivetally", line 4, after "axle" first cocurrence insert — so as to permit relative tilting movement of the latter and said frame --

Claim 6, lino 2, cancel "springs and". line
4, after "axlo" first occurrence, insert - so as to permit
relative tilting movement of the latter and said frame -

Cancel claims 1, 2, 3, 7, and 8.

Ronumber claims 4, 5, 6, 9 and 10 as 1,

2, 3, 4 and 5 respectively. Add the following oluims:

- 6. In a vehicle, the combination of front and rear axies, a body mounted thereon, a frame secured to the rear axies and having a connection with the front axie permitting moviment of the latter with respect to said frame about an axis substantially at right angles to the said front axie. can a tension red directly connecting the rear axie with the forward part of the body, substantially as described.

7. In a vehicle, the combination of front and rear axiss, a body mounted thereon, a frame secured to the rear axis and having a connection with the front axis permitting movement of the latter with respect to said frame about a horizontal axis substantially at right angles to the said front axle, and tension rods directly connected to the rear axle with the forward part of the body, substantially as described.

REMARKS

It is submitted that claim 1 (former claim 4) clearly and patentably distinguishes from Pearson of record. Pearson, in lines 82 to 88, page 1 of his natent states that the front of the carriage body is conneoted indirectly to the rear axle B by means of rods P. the rear ends of the latter being connected to the axleframe rods 0.0 (and by them to the rear axle). The construction set forth in this claim is especially adapted for a vehicle wherein the front axle may tilt freely with respect to the axle-coupling frame about a horizontal axis without distorting such frame and without imposing stress thereon, while at the same time the vehicle structure is stiffened and strengthened against shocks due to inequalities in the readway and to starting and stopping of the vehicle by means, such as the tension rods described in the claim. The construction disclosed in Pearson is obvicusly not adapted for a vehicle of this type for in case of the tilting of the front axle of Pearson's device strains would be imposed on the axle-coupling frame C through the truss rods P and the frame C would oppose such tilting movement. Moreover, the construction called for in the claim has the further adventage over Pearson of dividing more or less of the strains to which the vehicle structure is subjected between the vehicle body and the rear axle and relieving such strains from the axle-coupling frame as

was clearly brought out in the remarks on page 4 of the amondment of May 10, 1913.

While it is believed that claims 2 and 3 (former claims 5 and 6) clearly distinguish from Pearson as presented in the last amendment, these claims as amended still further differentiate from this reference by specifying that the frame is secured or pivotally secured to the front axle no as to permit relative tilting movement of the latter and said frame. This feature is not disclosed in Pearson.

New claims 6 and 7 presented herewith are drawn along the lines of allowed claims 4 and 5 respectively. These claims clearly differentiate from Pearson for reasons similar to those set forth on pages 4 and 5 of the amenament of May 10, 1913 in connection with claims 4 and 5 (former claims 9 and 10), and are thought necessary in order to adequately protect applicant in his invention.

For the rossons above set forth further consideration and allowance of the claims are respectfully requested.

Respectfully submitted.

his Attorney.

THOMAS A. EDISON. By Frank L. Dyer

Orange, New Jersey.

July /3 1914.

WAH-KOK

DIV. Room 236

"The Commissioner of Potents,
Weshington, D. C.,"

(в)

Paper No. 6

All communications respecting this optication should give the serial number, date of filing, title of laventice, and more of the neptication.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

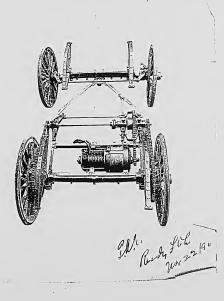
ASHINGTON Juguet 27, 1914.

Amended July 16, 1914.

The statement of invention is not commensurate with the claims now in the case.

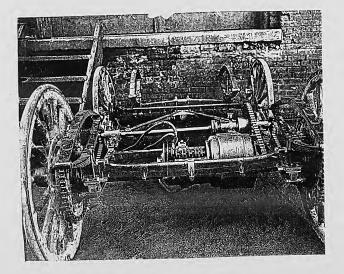
Claim 1, (former 4) is not patentable ever Pearson of record. The braces P perform substantially the sare function as applicant's braces, and the fact that they are connected to frame C a short distance from the axis would not interfere with the rocking action of the frame C is rigidly secured to that in Milhard of record the frame C is rigidly secured to the rear axis and pivotally socured to the front axis, and the braces R correspond to applicant's braces T2 and have the care function. Patent to Mason, 376,826, Jan. 3, 1886, Cl. 21-106, and also Marks, 105,986, Jan. 19, 1875, same class, show that it is old to extend a bracket from the rear exis to the body above the front axis or spring. It is believed that all the claims are substantially anticipated by Millard especially in view of Mason and Marks, oited.

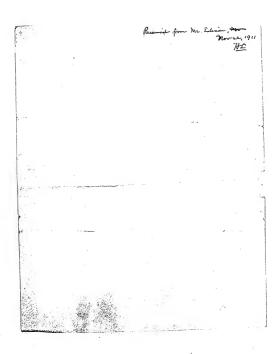
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2/19/12- Application automatical

To Mr. Edward, who stated that
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passed which he demed to
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Turned day over to Leuro
for truss-rock - See Bliro
HS

Patent Series

Patent Application Files

Recording and Reproducing Combined Aural and Optical Impressions Folio# 833

Serial #: 687967

Primary Applicant: Higham, Daniel Date Executed: 4/1/1912

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	new york City
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10	FRANK L. DYER,
	Counsel,
	Orange; New Jersey
	Company of the Compan

Petition.

To the Commissioner of Patents:

Pour Potitioner DANIEL HIGHAM, a citizen of the United States, residing and having a Post Office address at \$43 Bant 27th Street, New York, County of New York and State of New York

prays that letters patent may be granted to him for the improvements in

- METHODS OF SYNCHRONOUSY RECORDING AND REPRODUCING OPTICAL INCRESSIONS AND BOUNES ASSOCIATED THE METHOD IN THE PRODUCE OF THE

set (orth in the annexed specification; and he hereby appoints Frank V. Oper (Registration No. 560), of Stange, New Jersey, his attorney, with full power of substitution and redocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all husiness in the Patent Office commetral therebuilth.

Daniel Higham

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

BE IT KHOUN, that I, DANIEL HIGHAIL, a citizen of the United States and a resident of New York, in the County of New York und State of New York have made certain new and useful improvements in NEWHODE-OF-OWN.

CHINGHOUSEN RECORDING AND REPRODUCTION OFFICIAL IMPRESSIONS AND SOURCE LEGISLES. PARTIEW YOUN, of which the following is a description:

By invention relates to methods of synchronously recording and reproducing optical imprecions and sounds associated therewith, and is particularly explicable to the so-called "talking pictures", in which a ceries of moving pictures are exhibited upon a screen or otherwise, this visual record being accompanied by the record of the sounds appropriate thereto, delivered in exact synchronism, each sound with the picture or pictures to which it belongs.

In making sound records for "talking pictures", the location of the course of sound close to the horn or receiver of the recording instrument, as is common in making ordinary sound records, is usually impracticable, partly because in meet of the riess to depicted, the sounds amanate from various more or less separated points and also because it is ordinarily desirable to exclude the phonograph from the sounce exhibited by the pictures. Furthermore, when the source of sound is located in close proximity to the horn of the recording instrument, there are certain disturbing influences which affect the recording operations, by reason of which influences the

quality of the recorded sounds is so affected as not to be truly roprosentative of the original sounds. One of those influences is due to the fact that the amplitude of the recorded vibrations is so large that the resistance to the entrance of the cutting edge of the recording stylus into the material of the record blank increases very rapidly from the beginning to the end of the cut; or, in other words, the energy required to force the cutting edge into the material for the first quarter, for example, of the out is very much less than that required to force the cutting edge into the material for the final quarter of the cut. Consequently, sounds which are relatively weak, are more perfectly recorded than very loud sounds, because with the former, the amplitude of vibration of the recording stylus will more nearly coincide with that of the sound waves. Another of those disturbing influences is due to the inertia and momentum of the diaphragm and recording devices carried by or connected with the same. As a result, when the disphragm is subjected to vibration of considerable amplitude, the momentum of the parts causes the recording stylus to subsequently cut to a disproportionately great whith . For these reasons, I find that the quality of the recorded sounds is in invorse ratio to the loudness thereof, so that when the attempt is made to make a deep record, or a record of great amplitude, the louder notes are generally of poor quality, and are out of proportion to the notes or sounds of less amplitude.

The principal object of my invention is to provide a method whoreby the above named objections are aliminated. In accordance with this object, I place the phonograph or recording instrument at such a distance from the source of sound that the source obtained is

formed of vibrations of small amplitude, the phonograph or recording instrument being proferably without the range of the photographic camora employed for making a record of the optical impressions. The camera having been properly focused on the source of the optical impressions, I simultaneously photograph the latter and record tho sounds associated with the same. The sound record obtained in this way, although of superior suality due to the small amplitude of the vibrations thereon, is too weak when reproduced directly to be unful for producing realistic offects in combination with the pictures associated thorowith. I accordingly obtain from the master record tions made, an amplified copy theroof, preferably by an apparatus by which the record is mechanically transferred and amplified. A positive having been made from the photographic film or other element affected by the light in taking the original photograph, the said positive and the amplified duplicate record when synchronously reproduced give a faithful, pleasing, and realistic reproduction of the original optical improssions and the counds associated therewith.

In order that my invention may be better understood, attention is directed to the accompanying drawings forming a part of this openification and in which -

Fig. 1 is a diagrammatic side view showing the preferred relative positions of a source of optical impressions and sounds, a photographic camera, and a recording instrument;

Fig. 2 is a view partly in cross section and partly in elevation illustrating my proferred embediment of mechanical amplifying and duplicating apparatus; Figs. 3 and 4 are diagrammatic views showing the relative positions of the recording stylus and the record for two different depths of cut of the stylus, one twice the other, those views serving to illustrate the rapid increase of the cross section of the material to be removed by the stylus during the latter part of the outting operation; and

Fig. 5 to a diagram illustrating graphically the area of material removed by the stylus for each of the four numbers of two outs, one twice as deep as the other.

Referring to Fig. 1, the numeral 1 designates a suitable source of sounds and optical impressions, such as o person dancing and singing, the numeral 2 a photographic camera, and the numeral 3 a suitable recording instrument. such as a phonograph of common construction having a rotatable support for a record 4 and a stylus movable transversely thereof, as is common in the phonographic art. The dotted lines in Fig. 1 define the limits of the range of the camera 2, the object 1 being located within the rango and field of the camera and at the proper focal distance from the latter. The recording phonograph is located a considerable distance from the object $\underline{1}$ and without the range of the camera \underline{z} so that it will be excluded from the picture taken by the camera. The performer, or source of the sounds and optical impressions, and the recording machines having been arranged in proper relative positions, the machines are started in operation at the proper time and the combined optical and sound records simultaneously made.

The optical record and the master sound record having been thus made, I now obtain an amplified copy of

the master sound record, preferably by apparatus by which the record is mechanically transferred and amplified. A suitable apparatus for the purpose is indicated in Fig. 2, in which master 4 is carrief on the mandrel 5, and_ the blank 6 is carried on the mandrel 7. Those mandrels are rotated simultaneously by any suitable goaring at a low speed, so that the surface speed of the master is sufficiently low to prevent any disturbing influence due to momentum or incrtia of the moving parts. apparatus, the numeral 8 designates a support on which s member 9 is pivoted for movement substantially at right angles to the axes of the mandrels $\underline{5}$ and $\underline{7}$. This member 9 carries at its forward ond two alined pivots 10 and 11 supporting a weight 12 and permitting the latter to move in a direction substantially parallel to the axes of the mandrels 5 and 7. A lover 13 is pivoted to the weight 12 for movement towards and away from the record $\underline{4}$ and the blank 6. The numeral 14 indicates a manually movable lever by which the weight 12 may be lifted or by which it may be supported when there is no record on the mandrel 5, the dernward movement of the said lever 14 being limited by a suitable stop 15. The lover 13 darries at its lower portion a stylus/proferably of sapphire adapted to track the record grooves formed in the master 4, and is formed with an clongated portion 17 carrying at its outer end a recording or cutting stylus 18 adapted to operate upon the blank 6. The styluses 16 and 18 are so arranged with respect to the pivot of the lever 13 as to give the desired amplification. In practice I find that with my preferred arrangement of recording apparatus, the maximum depth of out obtained on my master record is about .0004"; so that by employing an amplification of two to one, I obtain on the duplicate record a maximum depth of cut of about .0008", a very satisfactory depth for sound reproduction.

A tension opring 19 connected to the lever 13 corves to withdraw the ctylus 18 from the blank 6 when the weight 12 is lifted by the lover 14. By reason of the pivotal mounting of the weight 12 hereinbefore described, the stylusos are permitted to remain in firm engagement with the master record and blank regardless of any secentricities or other irregularities in the came and the ctylus 16 is permitted to follow the lateral or other irregularities in the record groovs in the master $\underline{4}$. It is obvious that the relative axial movement between the styluses and the record and blank may be obtained either by the axial movement of the mandrels 5 and 7, together with the record and blank supported thereby, or by mounting the parts 8 and 14 on a braveling carriage moveble axially of the mandrels $\underline{5}$ and $\underline{7}$. I profer, however, to have the part 8 stationary and to secure the necessary feeding movement by an axial movement of the mandrals and the record and blank supported thereby. Mechanisms suitable for producing the said feeding movement are well known in the phonographic art.

In operating the duplicating apparatus described above, the weight 12 is first lifted by means of the lever 14 to permit the record 4 to be placed on the mandrel 5. After the said record is in position, the weight 12 is lowered sufficiently to permit the blank 6 to be placed in position on the mendrel 7, after which the lever 14 is released to permit the weight 12 to move the styluses 16 and 18 into firm engagement with the record 4 and the blank 6 respectively. When now the motive means for the duplicating apparatus is set into operation to relate the madrels 5 and 7 and to preduce the proper feeding movement between the styluses 16 and 16 and the master record and

blank, the blank will be provided with a record thorein which will correspond with that on the master, except that it will be simplified. The photographic film or other light affected clement containing a record of the acome photographed having been developed and a positive made therefrom, a faithful and realistic reproduction of the original optical impression and the counds associated therewith may be made from the suid positive and the amplifica sound record by suitable symplecticities mechanism, such as that dioclosed in my passions of the cound to the cound that the suitable symplectic mechanism, such as that dioclosed in my passions of the cound to the cound that is the suitable symplectic mechanism.

Figures 3, 4 and 5 serve to explain the causes for the reduction of the amplitude of the sound waves with the recording apparatus arranged in accordance with my invention and also the causes for the improved quality of sound record resulting from said arrangement. Referring to Figures 3 and 4, the numeral 20 designates a circle representing the contour of the outting edge of the recording stylus, and the numeral 21 designates in cross scotion the portion of the record or blank operated upon. . The former of these figures shows a depth of cut one-half of that shown in the latter, this ratio of the depth of the cuts being the same as the preferred ratio between the depths of the cuts in my master and amplified duplicate records respectively. An inspection of the areas between the dotted lines and the lower portions of the circles 20 in these figures will show roughly that the amount of material to be removed by the recording stylus, and the resistance to the cutting of the said stylus increases rapidly with the depth of cut. This rapid increase is more clearly shown in Fig. 5. In this figure, I have plotted the eross sectional areas of the material removed by the recording stylus for each quarter of each of two

outs, one twice as deep as the other. In making the computations for this figure, the maximum depths for the two cuts were taken as .0004" and .0008" respectively, those being approximately the maximum depths respectively for the master record and amplified duplicate record preferably obtained by me in practicing my invention. The diameter of the cutting edge of the recording stylus was taken as .050", a diameter which is common in practice. Referring to Figure 5, the line 25, 24, represents the cross sectional area of the material removed during the first quarter of the larger of the two cuts in question, or approximately the resistance of the stylus in making the said cut; to the same scale, the line 25, 26 represents the area removed or the resistance to the cutting during the second quarter of the said out, the line 27,28, the area and resistance during the third cuarter, and the line 29,30, the area and resistance during the fourth quarter. The rate of incrosso of resistance to the cutting effect of the ctylus is graphically reprocented by the curved line 22,25,25,27, 29. From this diagram, it will be evident that as the stylus cuts into the material, the resistance encountered thereby increases very rapidly and becomes very pronounced as the stylus reaches the maximum depth, the distortion of the sound waves therefore increasing rapidly with their increace in amplitude. It is also evident from this diagram that if the intensity of the sound waveo be diminished, the amplitude of the record vibrations will likewise diminish; oo that, if the recording instrument be located a conciderable distance from the source of sound and optical imprescions, as in my invention, the intencity of the sound waves will not be sufficient to record vibrations of the same amplitude as would be produced if the cource of sound wore located close to the recording instrument.

the location employed in ordinary sound recording. curve 22, 31, 32, 33, 34, which is plotted to the came scale and in the came manner as the curve 22, 23, 25, 27, 29 represents a maximum out of the lesser of the two depths referred to above. From a comparison of the two curves plotted in Figure 5, it will be again seen not only that the amount of material to be removed is much less for the shallower cut than for the deeper cut, but also that the resistance to the cutting of the stylus as the latter enters the record meterial is more nearly uniform for the former than for the latter cut. It is accordingly evident that although the sound record obtained when the sound recording instrument is located a considerable distance from the source of sounds, as is done in accordance with my invention, is weaker than that obtained when the recording instrument is in close proximity to the source of sound, the record obtained is of improved quality: so that, when the said record is amplified as described above, a sound record of desired intensity and exceeding purity and faithfulness is obtained. My invention, therefore, presents a practical method of excluding the phonograph or other recording instrument from the field of the camera and at the same time obtaining a faithful reproduction of excellent quality, fully the

While the distribute formed from the blank 6 might be used directly in the reproduction of the original sound record, I prefer to make duplicates thereof by any of the wellknown processes known in the phonographic art. It is obvious that many other changes may be made in the exact particulars of the method described without departing from the opirit of my invention.

What I claim as now and dosire to protect by

Letters Patent of the United States is as follows:

- 1. The method of synchronously recording optical improssions and sounds associated thorewith which consists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with and impression of a phonograph located at a relatively great distance from the source of said sounds, in obtaining with the phonograph record a supplicate sound record of increased amplitude, and in utilizing the light-affected photographic element in making a positive, whereby said positive and said supplications of sound record are supplied when synchronously reproduced to accurately reproduce the original optical impressions and the sounds associated therewith, substantially as set forth.
 - 2. The method of synchronously recording optical impressions and sounds associated therewith which consists in photographing the source of the optical impressions and in simultaneously recording the dyunds associated with said impressions on a phonograph theated at a relatively great distance from the source of said sounds, in obtaining from the phenograph record by amplifying mechanical transformers a department of the phenograph record of intreased amplitude, and in utilizing the light-affected photographic element for making a positive, whereby said positive and said supplication sound record are adapted when synchronously reproduced to faithfully reproduce the original optical impressions and the sounds associated therewith, substantial in a set forth.
 - S. The method of synchronously recording optical impreserions and sounds associated therowith which consists in photographing the source of the optical impressions and

in simultaneously recording the sounds associated with said 9/23/18 improssions on a phonograph located without the range of Incest A! 1/4/14 tung cound 7 3,18 the photographic camera, in obtaining from the phonograph _ 1/20/13 - 7 record a duplicate sound record of increased amplitude. and in utilizing the light-affected photographic element for making a positive, whereby said positive and said -andlified 123/13 duplicate sound record are adapted when synchronously reproduced to faithfully reproduce the original optical impressions and the sounds associated thorowith, substantially as sot forth.

- The mothod of synchronously recording optical improssions and sounds associated therewith which consists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with 160/13 said improcsions, on a phonograph located without the rungo of the photographic camera, in obtaining from the phone. resulting cound 7/20/13 graph record by amplifying mechanical transference a duplicate sound record of increased amplitude, and in utilizing the light-affected photographic element for making a positive, whereby said positive and said dupliamplified 1/23/13 ente sound record are adapted when synchronously reproduced to faithfully reproduce the original optical improssions and the sounds associated therswith, substantially as sot forth.
- 5. The mothed of synchronously reproducing optical impressions and counds associated therewith which consists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with said impressions on a phonograph located at a relatively great distance from the source of said counts, in obtaining from the phonograph record a supplicate record of increased emplitude, in utilizing the light-affected photograph

graphic element for making a positive, and finally in synchronously reproducing daid positive and said synticate record, substantially as set forth.

- 6. The method of synchronously reproducing optical impressions and accordinated therevith which condists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with said impressions on a phonograph leasted at a relatively great distance from the source of said sounds, in obtaining from the phonography record by amplifying mechanical transference a despitable record of inecomed amplitude, in utilizing the light-affected photographic closent for making a positive, and finally in synchronounly reproducing said pocitive and soid despitable record, substantially an set forth.
- The method of synchronously reproducing optical impressions and sounds associated therewith which consists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with suit may be a photographic content without the range of the photographic conserve, in obtaining from the photographic conserve, in obtaining from the photographic record a suplicate record of increased amplitude, in utilizing the light-affected photographic alonent for making a positive, and finally in synchronously reproducing said positive and said depressions.
- The method of synchronously reproducing optical impressions and accuracy associated therewith which consists in photographing the source of the optical impressions and in simultaneously recording the sounds associated with said impressions (on.a.phonograph located-without the range

and of enciotarily prof dictance from the among and annual of the photographic essence, in obtaining from the phonographic essence in a superior of the phonographic essence in a superior of increased amplitude, in utilizing the light-affected photographic element for meking a positive, and finally in cynchronously roproducing said positive and with all professions are superior of substantially as set forth.

This specification signed and witnessed this 1st day of april 1912

Baniel Higham

Fledinch Bachmann

2. France P. Klehm

Oath.

State of New Jersey ss.,

DAILED HIGHEL , the above named petitioner, being buly sworn, beposes and says that he is a citizen of the United States, and a resident of Now York, County of New York and Otate of New York

that he berily believes himself to be the original, first and sole inbentor of the improbements in methods of synohenologisty recording and reproducing oppion increases and sounds augociares thereview .

bescribed and claimed in the annexed specification; that he does not know and boes not believe that the same was ever known or used before his inheution or discovery thereof; or patented or described in any printed publication in the Anited States of America or any foreign country before his inheution or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the Ednited States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon sald inheution has been filed by him or his legal representatives or assigns in any foreign country.

Shorn to and subscribed before me this At day of april 1917

Ruma of Ruham

[Seal]

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Div. 7 Room 312

2-200

All communications respecting this application should give the serial number.

DEPARTMENT OF THE INTERIOR

WASHINGTON October 8, 1912.

UNITED STATES PATENT OFFICE

Daniel Higham,

C/o Frank L. Dyer,

Orango,

. augo,

OCT 8 1912

Now Jersey.

Please find below a communication from the EXAMINER in charge of your application.

Methods of Synchronously Recording and Erproducing Optical Impressione etc., filed April, 2, 1912 Seripl, #887,987.

The title in this case is unduly long and should be abbroviated.

Page 6, lines 13 - 15, the reference to a modified form, in which the parts 8 and 14 are mounted on a cerriage, should be illustrated on the drawing or eraced. Applicant will be allowed only to show this carriage in a conventional way, if he can point out such an old structure: and if he cannot do this, he will not be allowed to rotain this modification in the present case, as the present description is not opecific enough to support a spooffic structure of traveling carriage.

The claims are rejected on atheref the patents to Crombuum, (British), \$7,426, of 1909; (Be-16, Syn.); \$2 \\ Barker, (British), \$9,836, of 1909; (Be-16 Syn.); \$2 \\ \end{array}

in view of

Edison, #970,615, Sop. 20, 1910; Walcutt, #733,521, July 14, 1903; (181--16).

Greenbaum and marker each show a combination of machines for simultaneously recording pictures and sounds, and this same combinet ton is adapted to be used to reproduce these pictures and sounds. It is observed that the machines in these patents are located in class proximity to each other, and consequently the sound

records are more or less feeble, the same as in applicant, e device. Then all that applicant does in his method of procedure that is not followed out in the patented devices, is to amplify the more or less weak sound record before reproducing the erememinis is not thought to involve any degree of inventive skill in view of the expedient shown by Edison and Waloutt, cited. Thus the "method" claims treated as such are seen to present nothing patentable over the above art.

the claims are also rejected as being drawn to an impropormethod, since they merely recite the obvious stops in the operation of the devices above cited, as pointed out in the preceding paragraph.

Then considering the outstance of the claims, and disregarding the "mothed" form in which they are now drawn, they are thought to cover an aggregation, and are accordingly rejected. That is to may, whatever invention there is in the precent case is seen to recide in the specific amplifying means may, and not in its inclusion in the old combination of picture and sound machines. In fact, no co-action whatever is seen to exist between the amplifying means and the combination above referred to. Whatever improvement is to be derived from the amplifying of the sound record is held to relate to the sound machine alone, and should therefore be claimed in such manner.

The combination of picture and nound machines is shown to be old by the above patents; and since applicant obtains no new result by using an amplified record instead of the more or less feeble one, his invention does not lie in the substitution of the amplified record in this old combination but in this record glement alone or the device for producing the mano. See In Re

Media 100 0. G. 2178.

Exeminer.

IN THE UNITED STATES PATERT OFFICE.

DANIEL HIGHAM,
METHODS OF SYNCHROHOUSLY
RECORDING AND REPRODUCTING
OPTICAL I PERSSIONS AND
SOURDS ASSOCIATED THEREWITH.
Filed April 2, 1912,

Room No. 312.

Sorial No. 687,967.

HONORABLE COMMISSIONER OF PATRICTS.

SIR:

In response to the Office action of October 8, 1912, please smend the above entitled came as follows:

In the pressble of the upcoffication, change the title of the invention to read as follows:

- RECORDING AND REPRODUCING COMBINED AURAL AND OFFICAL TUPRESSIONS - .

In line 13, page 6, change "mounting" to - moving -; and in line 14, same page, cancel "on a traveling carriage movable".

In line 5, claim 1, owneel "on a phonograph located"; in line 7, came claim, change "phonograph" to - resulting sound -, and cameel "duplicate"; and in line 10, came claim, change "duplicate" to - amplified -.

In line 5, claim 2, cameel "on a phonograph

located"; in line 7, same claim, change "phonograph" to - resulting sound - : in line 8, same claim, cancel
"duplicate"; and in line 11, some claim, change "duplicate" to - amplified - .

In line 5, claim 3, cancel "on a phonograph located"; in line 6, same claim, change "phonograph" to - resulting sound - ; in line 7, same claim, cancel

"duplicate"; and in line 10, same claim, change "duplicate" to - amplified -.

In line 5, cleim 4, cancel "on a phonograph located"; in lines 6 and 7, same claim, change "phonograph" to reculting cound -; in line 8, same claim, cancel "suplicate"; and in lines 10 and 11, same claim, change "duplicate" to - amplified -.

In line 5, claim 5, cencel "on a phonograph located"; in line 7, same claim, change "phonograph" to - rosulting sound -, and "duplicate" to - sound -; and in line 10, same claim, change "duplicate" to -amplified -;

. In line 5, claim 6, cancel "on a phonograph located"; in line 7, same claim, change "phonograph" to resulting cound -; in line 8, same claim, change "duplicate" to - sound -; and in line 11, same claim, change "duplicate" to - complified - .

In line 5, claim 7, cancel "on a phonograph located"; in line 6, same claim, change "phonograph" to -resulting sound -; in line 7, same claim, change "duplicate" to -cound-; and in line 10, same claim, change "duplicate" to -couplified--;

In line 5, claim 8, cancel "on a phonograph"
located"; in lines 6 and 7, some claims, change "phonograph"
to _roculting cound - ; in line 8, some claim, change
"duplicate" to - cound - ; and in line 11, same claim,
change "duplicate" to - complified - .

REMARKS

The epecification as now presented is thought to be free from the objections raised by the Examinor in the first and second paragraphs of the last Office action.

The claims in this case are thought to be drawn to a proper method, the more fact that the method is best carried on by means of apparatus such as that disclosed being immaterial. It is well settled that a process or method though of a mechanical nature and best illustrated, by mechanism may, if new and useful, be the proper subject of a patent. Westen, 94 O.G. 1766; 1901 O.D. 290.

John R. Williems Co. et al. v. Miller, et al Mfg. Co. 107 F. 290 (M.Y.); 97 O.G. 2308; 1901 C.D. 517.

In Lawther vs. Hamilton, 124 U.S., 1, 6, the patent related to the extraction of oil from olongenous seeds. Notwithstanding the fact that the invention claims was performed by the oil of machinary, the Supremo Court held that the seme constituted a patentable process.

In view of the foregoing, it is thought that applicant's claims are properly drawn to cover a method. This being the caus, the last two paragraphs of the last Office action have no bearing on the invention as claimed.

In regard to the rejection of the claims, one of the steps of applicant's method to-wit: <a href="https://docs.new.org/doi.org

"an art, like every other invention, is a unit. Whatsvor number of acts it may employ, it is utill one; and any variation in the number or character of its olements which interest art, and, if hitherto unknown, a new invention. I has, the addition to an existing art of a single step by which its essential character is changed, or the omitsion of the act which was a necessary element

in the art as previously practiced, or even a material alteration in the order of the acts performed, is sufficient to destroy its unity, and produce another art which is entitled to the same protection as the old."

The patente to Groenbaum and Barker relate principally to apparatus, and it is well ostablished that to anticipate method or process claims, it is nocessary to show not only that the prior apparatus might have been used in carrying out the method or process claimed, but that such use was contemplated or that it would have occured to an ordinary mechanic. (See Carnegie Steel Company Ltd. ve. Cambria Iron Co. 22 Supreme Court 698: 185 U.S. 403: 46 L. Ed. 968: 99 O.G. 1866; 1902 C.D. 592, and Burdon Wire & Supply Co. vs. Williams. United Wire & Supply Company vs. Same, 128 F. 927.) Certainly these patents do not describe a use of the apparatus to perform the method herein claimed, and it is submitted that the said method would not occur to an ordinary mechanic, even though skilled in the art, merely upon the inspection of the said patents. The patents to Edison and Walcutt are apparently cited merely for the purpose of disclosing the amplification of a sound record.

An improved result is obtained by applicant's process; and as the art cited does not declose the said process, reconsideration and allowance are respectfully requested.

Respectfully submitted,

By Stank L. Dues

Orange, New Jereey, September 23, 1913.

FB.KCK

2-260

N. Paper No. A......
All communications respecting this application should give the serial number date of filling, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

Frank L. Dyor,
Ocrango,
Oct 24 1913

Please flad below a communication from the EXAMIRER in charge of the application of Mariel Historia, Tiled April 2, 1912, Methods of Synchronously.

Resoluting ato., Serial #667,967.

Commissioner of Potents

Cape reconsidered as amended Sep. 24, 1915.

The chains are rejected on the references and for the reasons of record.

It is pointed out that in Greenhaum and marker, of record, the recording phonograph in shown as being located without the range of the owners, as called for in claims 4, η , and 8. This is noncover, held to be a very obvious arrangement of the two apparatus.

The point is again emphasized that the novelty in this case, if any, must reside in the sound record amplifying feature por so, which in properly exeminable in the class of Acoustics in Division 23.

J. R. M.

Examiner.

W

IN THE UNITED STATES PATENT OFFICE.

HONORABLE COMMISSIONER OF PATENTS,

SIR:

Serial No. 687.967.

In response to the Office action of October 24, 1915, please amend the above entitled case as follows:

In line 22, page 2, change "depth" to - amplitude -, and in line 25, same page, cancel "deep record,or a".

In line 10, page 3, after "directly" insert -thy ordinary or non-amplifying reproducing apparatue -. and in line 12, eame page, after the period (.) insert the following: - By the use of amplifying reproducing apparatus, such for instance as shown in my United States patent No. 1,036,235, the cound record thus made may be reproduced with sufficient loudness, but I have found that amplification of sound is not all that is required for realistic effecte in talking pictures. By using the sound record made as described above as a master record and making therefrom an amplified sound record, as by mechanical transferring meane, I have discovered that the amplified record thue obtained gives a decided improvement in realistic effects by reason of the naturalness and truences of the eound reproduction. This offect is not obtained by more amplification by amplifying reproducing apparatus such as shown, for example, in my patent referred to above - .

In the 8th line from the bottom of page 9

change "duplicate formed from" to - amplified record upon -

In line 6, claim 3, after "camera" insert - and
at a relatively great distance from the source of said sounds - .

In line 6, claim 4, after "onmera" incert

- and at a relatively great distance from the source of said sounds - $\boldsymbol{\cdot}$

In line 6, claim 7, after "camera" insert
- and at a relatively great distance from the source

- and at a relatively great distance from the source of said sounds - .

In line 6, claim 8, after "camera" insert
- and at a relatively great distance from the source of
said counds - .

REMARKS

It is thought that the claims as now drawn cover a patentable method. That the claims are properly drawn to a method will, it is thought, be obvious by consideration of the following quotation from Walker on Patents, 4th Ed. page 3:

"The generic definition of process is "on operation performed by rule to produce a result'. Operations performed by rule to produce a result'. Operations performed by rule to produce a result'. In operations which consist performed to wholish each operation which consist performed to the performed by the produce of the performed by the produce of the performed by the produce of the performed by the performed by

In view of the above, applicant cannot possibly understand why the invention disclosed is not a patentable method. The transactions set forth in the claims are performed by rule to produce a single new result, to-wit the faithful and realistic recording and reproducing of combined aural and optical impressions. These transactions are not limited to the peculiar functions of any particular machines, but may be performed by different means and in different ways. The step, for example, which consists in obtaining a sound record of increased amplitude may be performed by the mechanical transferring apparatus disclosed. or it may be porformed in other ways, though the mechanical transferring means disclosed are preferable. If the Examiner desires to adhere to his position originally taken that the claims are drawn to an improper method, he is respectfully requested to explain his position more fully in view of the above remarks.

Considering the references cited by the Examiner. none of these references disolose applicant's improved process. The patents to Greenbaum and Barker do not disclose the step of obtaining a sound record of increased amplitude by amplifying mechanical transference or in any other way. The patents to Edison and Waloutt do not relate to talking pictures and offer no suggestion of applicant's process. As to the patents to Greenbaum and Barker, the Examiner ie, of course, aware of the fact that a method or process is like a combination in apparatus claims in that it is a unit and that any material variation in the number or character of its elements destroys or changes the process. The employment of the step of obtaining an amplified sound record for reproduction, which is not disclosed by Greenbaum and Barker produces an entirely different process from that disclosed by the said patentees, the process thus obtained being of a very improved character in the giving of realistic

effects in reproduction. It is thought that the Examiner does not fully appreciate the improved results obtained by the applicant. Applicant's object was not morely to obtain loudness of reproduction. The object was primarily to produce realistic offects in talking pictures, and this effoot may be speiled by excessive lquiness. It is faithfulness of reproduction and the proper differences in character or tone by which our cars judge of the distance of sound and partly also of the movements of the performers in the pictures that applicant desired to obtain and has obtained by this invention. It was not obvious to the applicant prior to this invention, how the desired improved results tending towards realism in the talking pictures could be obtained. Applicant, who has been working almost exclusively on talking pictures for a considerable number of years. conducted numerous experiments running over a long period boforo he discovered the method claimed and advantages obtained thereby. He then found, amongst other things, that vory improved results in realistic effects, which could not be obtained by the amplifying reproducing apparatus shown in his patent referred to above, were obtained by the amplification of the record, as by amplifying mechanical transforence. Applicant's method is thought to be the first by which practical roalistic talking pictures have been obtained, and as this method is not disclosed nor suggested by the prior art, it is thought that the claims should be allowed.

Reconsideration and allowance are accordingly respectfully requested.

Bespectfully submitted,
DANIEL HIGHAM,

Orange, New Jersey, October 6 1914. his Attorney.

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Div. 7 Room 312

Abless only

"The Commissioner of Potents,
Washington, D. C.,"
and not any official by same.

2-260

M. Paper No. ... 6....
All commandestions respecting this application should give the serial number, date of filling, title of invention, and

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

.....00t. 29,...1914....

Orange,	
н	
Please find below a communication fr	om the EXAMIHER in charge of the application of
Daniel Higham, filed Apri	1 2, 1912, Wethodo of Synchronously
necording and Reproducing	Optical Impressions etc., Serial
#687,967.	Thomas Turing,

Case reconsidered as amended Oct. 7, 1914.

who ground taken by the examiner that the claims do not state a proper method is receded from; but the other grounds of rejection are believed to be sound and are adhered to. The claims are again rejected.

the following publication will show that the desirability of amplifying the sound upon being reproduced has been felt, and that an endeavor has been made to accomplish this end:

"The Hickelodeon". Feb. 18, 1911, Vol. V. No. 7 pages 189190. (A copy of which is to be found in this office). The microphone and horn that are generally used amplify the counds to
a certain degree; and thus it is held that applicant's invention
does not consist in the synchronizing combination but in the amplification of sound records per se, which feature belongs to the
class of "Acoustics" examinable in another division of this

Before film word

Examiner

IN THE UNITED STATES PATENT OFFICE

Daniel Highem

RECORDING AND REPRODUCING COMBINED AURAL AND OPTICAL IMPRESSIONS

Filed April 2, 1912

Serial No. 687,967

HONORABLE COMMISSIONER OF PATENTS.

STR:

The Office action of October 29, 1914 has been carefully considered.

Room No. 312.

Referring to the contention of the Examiner that "The microphone and horn that are generally used amplify the ecunde to a certain degree; and thus it is held that applicant's invention does not coneist in the synchronizing combination but in the amplification of sound records per se", the ordinary use of microphones and home to amplify ecund dose not correspond in any way with the step in applicant's process of obtaining a sound record of increased amplitude as by the use of amplifying mechanical transferonce. In talking pictures the microphone or horn has apparently been used only as a part of the final step of eynchronously reproducing the positive and the amplified record. In applicant's process this is a step entirely distinct from the etep of obtaining an amplified ecund record. What applicant has really done is to introduce a new step in the process of producing talking pictures, this new step producing essentially a new result.

Furthermore, applicant has tried many forms of miorophones under various conditions in connection with the production of talking pictures, and he has seen many experiments conducted by Mr. Edison for the same purpose; yet in not one of these cases did the sound have a suitable quality of tone to produce the necessary illusion that the sound emanated from the objects in motion. In other words, the sound produced was not of such quality as one would expect to come from the images seen. Applicant has discovered that by the production of an amplified record in the manner described and claimed, the proper quality excepts on be given to the aural portion of the talking picture production. In this connection, the Examiner's attention is again directed to Figures 3, 4 and 5 of the drawings and makes 7, 8 and 9 of the specification.

The more fact that there may have been an improvement in a particular part of the process or the addition of a single new step does not negative patentability in a new and complete process containing this step as one of its elements. There is no reference of record showing anything which is the substantial equivalent of the process set forth in the claims, and the Examiner is no doubt well aware of the numerous decisions holding that a process, like a combination, is a unit, and the addition to an existing art of a single step by which its essential character is changed or any other material alteration in the existing art produces a new art which is entitled to the same protection as the cld. See Robinson on Patents, Vol. 1, page 255; Victor Talking Machine Co. vs. American Graphophene Co., 189 F.

The new reference cited by the Examiner, to-wit, the publication in "The Bioleoleon", does not disclose an anticipation of epplicant's invention. In fact, the whole article clearly points out difficulties in the colution of the problem undertaken and solved by applicant, but gives no idea as to how these difficulties can be overcome. On page 190 of the said publication, for example, it is stated as follows:

"The registoring of sounds at a dietance was hard to accomplied them symbronism. Hitherto the membranes that formed an essential part of the graphopione had given very unsatisfactory results. The sound of an orchestra could be recorded at a distance of several years, but a sound at half of the instrument, and the apparatus gave forth only fifty percent of the cound it received.

In another place the eaid publication etates:

"Owing to the impossibility of registering counds at a dictance, the graphophone had to be placed between the biograph camora and the subject, and so it was impossible to obtain the desired result."

This difficulty which the publication states made it impossible to obtain the desired result use entirely overdome by applicant and in a way that produced such superior results that by meane of applicant's invention it was possible for the first time to produce commercial talking ploturee on a large scale. In spite of the fact that the use of the amplifying horn and microphone were well known at the date of the publication in question, a desirable reproduction of the sound is referred to as a real difficulty in the production of commercial talking ploturee. It is thought that the Examiner will agree that the mere statement in the publication referred to that Mr. Gaumont hee

some secret means of overcoming the difficulties referred to, is not an anticipation of applicant's claims.

It is thought that applicant's claims are patentable, and reconsideration and allowance are accordingly requested.

Respectfully submitted,

DANIEL HIGHAM

By Grang L Dyce

His Attorney

Orange, N. J.

September // , 1915

FB-JS

Div. 7. Room ...312

**Sidest only

"The Connelations of Patents,
Washington, D. C.,"

and not my official by same.

Frank L. Dyer.

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PATENT OF

8 9 3

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON Oct. 21, 1915.

Oranga,	OCT 21 1915
New Joracy.	OCT 21 1915
Please find below a communication from the EXAMINER in charge of	the application of
D. Highem, filed April 2, 1912, Methods of Sync	hronoualy Record-
ing and Reproducing Octical Impressions and Sou	ndu Associated
Therewith, Serial No. 687,957. Thorney	Ewing towns
E 6DE31	

Case reconsidered in communication with communication of Sec. 13. 1918.

It is repeated that the "Nickelodeen" publication was cited simply to show that the necessity of amplifying the sound resort had been felt and an effort made to meet this necessity. Instead of emphasizing only the paragraph quoted by applicant, attention should also be given to the paragraph beginning near the foot of column 1 on page 190 of this article, in which mention is made of several means by which the amplification of counds was obtained and improved. Then in view of this disclosure and the well known means of amplifying the sound record as shown by the art cited, the adoption of the last named means to meet the well known demand in held to be very obvicus. The expediency of amplifying sound records is recognized as being the same, whether used also with moving pictures. The rejection of the claim in therefore repeated.

The rejection on the ground that the invention resides in the amplifying means per se is also repeated, openial attention being called to the first office letter, last two paragraphs.

JRM.

Examiner.

IN THE UNITED STATES PATENT OFFICE

Daniel Higham

RECORDING AND REPRODUCING COMBINED AURAL AND OPTICAL IMPRESSIONS

Room Ho. 312

Filed April 2, 1912 Serial No; 687,967

HONORABLE COMMISSIONER OF PATENTS.

S I R : -

In response to the Office action of October 21, 1915, please amend the above entitled case as follows:-

Page 7, lines 10 and 11, change "pending application S.N. 461,869, filed November 10, 1906" to - United States Patent No. 1,054,203, dated Pebruary 25, 1913 - , Page 9, line 24, after "quality" insert - and of

producing faithful and resiletto talking ploture effects - .

Cancel claims 1, 2, 5 and 6 and renumber claims
3, 4, 7 and 8 as 1, 2, 3 and 4 respectively.

REMARKS

In view of the last Office action, this case has again been carefully considered. Applicant's invention does not consist merely in the amplification of sound, but it consists in a method whereby the production of realistic effects in talking pictures in accomplished. By applicant's invention, not only was it possible to exclude the sound recording apparatus from the field of the osmera, but

it was possible to obtain sufficiently true reproduced counds to give a good illusion that the reproduced counds emanate from the objects in motion.

Furthermore, the amplification of eound referred to in the last paragraph, column 1, page 190 of the Midkelodeon is not the equivalent of the step in applicant's method of producing an amplified sound record. It relates more nearly to the final step in applicant's process of finally reproducing the positive and record in synchronism, in that in the latter step use would probably, though not necessarily, be made of a trumpet, and uso might be made of the other apparatus described in the said paragraph. Applicant's step of amplifying the sound record is entirely distinct from anything disclosed in the said article. Referring to Robinson on Patents, Vol. 1, page 253, Mr. Robinson points out that an art or a mothod is a unit and that the "addition to an existing art of a single stop by which its essential character is changed * * or even a material alteration in the order of the acts performed, is sufficient to deetroy its unity and to produce another art which is entitled to the eame protection as the old". The step of amplifying the sound record ie an addition to the prior methods and it produces in talking pictures a result which is superior to any obtained before applicant's invention. Again, admitting that it was old prior to applicant's invention to amplify counde in connection with talking pictures, no one prior to applicant employed this etep in the same order as applicant in a method of producing talking pictures. Ho one made an amplified sound record in talking pictures prior to the reproduction of the record in eynchronies with the exhibition of the picture. Applicant has, by the improved method herein described, made a clear advance in the production of reslictic talking picture offsets; and the invention is not disclosed nor, it is submitted, is it suggested by the prior art. Nor doce the fact that there may be invention in the apparatue used negative patentability in the method.

Although it is thought that the publication in the Nickoledeon is not in any way an anticipation of applicant's claims, the invention herein claimed was completed before the date of said publication, and an affidavit to this effect is presented herewith.

The canceled claims are thought to be patentable, but they have been canceled with a view to expediting the allowance of the case inasmuch as the romaining claims adequately protect the invention.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

DANIEL HIGHAM

Frunk (Descr

Orange, N. J.

IN THE UNITED STATES PATENT OFFICE

Daniel Higham

RECORDING AND REPRODUCING COMBINED AURAL AND OPTICAL IMPRESSIONS

AURAL AND OPTICAL IMPRESSI

Filed April 2, 1912

Serial No. 687,967

Room No. 312.

APPIDAVIT OF DANIEL HIGHAM

State of New Jersey)
County of Essex

88.:

DAHIEL HIGHAM, being first duly sworn, deposes and says that he is the same Daniel Higham whose application for Lettors Patent for Recording and Reproducing Combined Aural and Optical Impressions, Serial No. 667,967, was filed in the United States Patent Office on or about the 2nd day of April, 1912; that prior to February 18, 1911 he successfully carried out a mothod of recording and reproducing combined aural and optical impressions embodying the invention set forth in the claims of said application; that the following is an accurate description of said method:

A recording phonograph for recording sounds associated with objects in motion was placed without the range of a photographic camera employed for making a motion picture of the objects in motion, the phonograph being then at such a distance from the objects in motion that the sound record obtained was formed with undulations of small amplitude. Thereupon the moving objects were photographed by the said

camera and a record of the sounds associated with said objects was made by the recording phonograph. From the phonograph record thus obtained, a copy was made in which the vibrations were of increased amplitude, this copy being made from the original record by machanical transference. apparatus such as that shown in Fig. 2 of the drawings of eaid application being smployed for this purpose. This apparatus comprissă a lever having a tracing etylus arranged to follow the groovee in the original record and a recording stylue arranged to out the amplified vibrations into the amplified copy of the eaid record, the tracing etylus being nearsr the fulcrum of the lever than the cutting stylus. A positive was then made from the photographic film affected by the light in taking the original photograph; and the said positive and the amplified record were reproduced in synchronism, a faithful and realistic reproduction of the original optical impression and the sounds associated therswith being thus obtained.

That prior to Fobruary 18, 1911, the complete process described above was successfully performed many times
in New York City, II. Y.; that dependent doce not know and
does not believe that the above described invention has been
in public use or on sale in this country, or patented or
described in any printed publication in this or any foreign
country for more than two years prior to his above numed
application; and that he has nover abendened the said inventiod.

(April Famil Figure.

Sworn to and subscribed before ms
this / O day of Ootober, 1916

(April) January (Strict Hew Higher)

EVERTALY PUBLIC. STATE OF HEW HIGHER

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Cool

2-260

All denounications effecting this application should give the seriel number date of tiling, title of invention, and

DEPARTMENT OF THE INTERIOR

Fol 833

UNITED STATES PATENT OFFICE

WASHINGTON

-- Oct -- 21 -- 1916 -----

Prank Le Dyer,

Orange,

Bow Jersey.

Please find below a communication from the EXAMINER in charge of the application of

Daniel Highes, filed April 2, 1912, Methods of Synchronously

Recording and Producing Option! Impressions and Sounds Associated Therewith, Serial Bo.687,967. Jhour Commissions of Vanie J

Case reconsidered as amended Oct. 11, 1916.

The "fickeloddon" publication is withdrawn as a reference in this case; but the other grounds of rejection are adhered to and are hereby made final.

JRM.

Examiner.

Dre4 1911

Legal DEpt =

Have you potented we come a him with speaking Protine, The process

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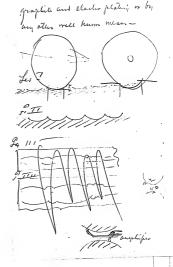
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Mighous ever not we make the string of some sounds with sensities recorded

Mr. Edison:-

FOLIO 833

I hand you herewith our copy of the application papers of Daniel Bigham, Serial Bo. 687,967, filed April 2, 1912 and entitled Recording and Reproducing Combined Aural and Optical Impressions. This case has been finally rejected in the Office action of October 21, 1916, and the question arises whether we shall take an appeal or abandon the application.

The invention relates to the method employed in producing talking pictures by the Kinetophone and all the claims are drawn to the method. Each of the claims includes the step of obtaining an amplified record of the original sound record which is to be used in conjunction with the positive film in synchronously reproducing the pictures and sounds associated therewith. We have contended that this step is novel, but the Examiner has finally rejected all the claims on the ground that there is no nevelty in the method, claiming that whatever invention there is in the amplification resides in the specific sound amplifying means.

There seems to be but little, if any, novelty in this case, and in view of the etatus of the Kinetophone business, you will probably wish this case abandoned. Under the arrangement made with Mr. Higham we are entitled only to a license under this invention. Mr. Higham has etated that he does not care to take an appeal in this case.

Kindly advice whether or not you wish an appeal taken.

William a. Hurdy

Patent Series Patent Application Files

Folio # 845 Storage Battery

U.S. Patent #: 1167485

Primary Applicant: Edison, Thomas A

Date Executed: 4/23/1912

dpuly Legal Dept. The moention consists with use Cerum Oxide in the positive tube of the alkaline slorage battery as described in pat. The Oxide is prepared by precipitating a Cernum calt by an alkali processing the preceptate free of the resultant salts, drying the pricepetate, and then igniting the precipitate in hydrogen que at a colite heat, cooling down is negorogen, and looking the same in tubes in proceedy the same manner as when mekel hypoxide or metallic Micheliklake is

Patent Series

Patent Application Files

Folio # 846 Record Tablet Molds

Serial #: 694658

Primary Applicant: Edison, Thomas A

Date Executed: 4/30/1912

[PHOTOCOPY]

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Folio No. 846	Serial No. 694658
Folio No.	
Applicant.	Address.
Thomas R. Edward	
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THE Board Tablet Mirida	
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Filed may 2. 1912.	Examiner's Room No.
	
Assignee	
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Girls	FRANK L. DYER; Chings
N. 2.	Counsel,
	Orange, New Jersey.
	and the second second
Contract of the second	and the first the well of the state of

Petition.

To the Commissioner of Patents:

Our Petitioner THOMAS A. ECISON, a citizen of the United States, residing and having a Post Office address at Llevellyn Park, Vost Owngo, Espex County, New Jerocy,

prays that letters patent may be granted to him for the improvements in

- RECORD TABLET MOLDS -

set forth in the annexed specification; and he hereby appoints Frank L. Where (Registration No. 560), of Orange, New Jersey, his attorney, with full power of stubstitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected thereboth.

Tromas A. Edison

SPECIFICATION.

TO ALL WHOM IT MAY COUCERN:

BE IT KNOWN, that I, THOMAS A. EDISON, a citizen of the United States and a resident of blewellyn Park, West Orange, in the County of Essox and State of New Jorsey, have invented certain new and useful improvements in RECORD TABLET NOLDS, of which the following is a description:

My invention relates to sound record and other tablets, and more particularly to apparatus for use in molding the same. In its preferred form, my invention is particularly designed for use in connection with the molding process set forth and claimed in an application of Jonas W. Aylaworth, Serial No. 674,289, filed January 30, 1912. According to this process, a bass or backing is provided with a surface covering or veneer of suitable moldable material, usually a high grade homogeneous material, the process involving the formation of the surface veneer upon the smooth polished surface of a metallic plats or other blank mold and the transfer of the same to the surface of the object to be coated under heat and pressure with the firm adhesion or wolding of the surface venser to the object. When the coated article is to be provided with a delicate impression, such as a sound record impression, the surface veneer should have a smooth homogeneous surface free from imperfections; and the surface of the plates or molds should accordingly be

capable of receiving a high polish and emouth finish. In order to pormit the use of the plates or molds commercially, the surfaces theroof should be capable of being cleaned without turnishing and of retaining their lustre in the air. One of the objects of my invention is to provide a mold or transfer plate having the above named properties.

In ite preferred form, the above mentioned process consists essentially in coating the curface of a blank mold or polished plate with a film of ingrediente, which, upon being heated, forme on the mold surface a surface layer or veneer of a hard, infueible, phenolic condensation product containing placticity ingredients, such that the veneer becomes sufficiently plactic upon being reheated to take an impression. The coating or film should preferably be applied to the mold in a plurality of very thin layers; so as to facilitate the drying thereof and to encure against the presence of air bubblee in the same. The object to be surfaced is pressed into contact with thie hardened veneer in the mold with the application of heat sufficient to cause the object and the surface layer to become firmly welded together, the molded object then being cooled and removed from the mold with the surface lay er or veneer adhering thereto. The coated blank can then be heated and pressed in a sound record or other mold to receive the desired impression upon the surface thus formed. The material applied to the blank surface may be a solution of a fusible, coluble, phenolic condensation product, such as the phenol reein described in an application of said Jonas W. Aylsworth, Serial No. 496,060, filed May 14, 1909, together with a hardening agent therefor containing the

methylene radical, such as hexa-methylene-tetra-mamne, in a suitable solvent, such as anyl-alcohol. Penta-chlorophenol may be used as the planticity ingredient in the surface composition. An object of my invention is to provide a mold or transfer plate of such a character that surface materials such as tose mentioned above have no tendency to adhere to the same, the mold or tronsfer plate thus permitting the formation on the molded articles of a surface having the same finish as the mold surface. The mold should also not be affected by the substances in which the surface composition is dissolved or by substances, such as caustic sods, which may be employed for cleaning the same. Other objects of my invention will appear more fully in the following specification and appended claims:

As a result of experiments conducted with the above objects in view, I have found that the desired qualities for the purposes specified above are possessed by molds formed of or having a surface portion comprising metallic substances containing nickel. The nickel may appear in the mold in varying amounts or in different alloys; and the said substance may merely be employed for the surface portion of the sold, or the entire sold may be formed of the same. Pure nickel molds give the most satisfactory results; but the high cost thereof renders the same unsuitable for commercial use, a large number of molds being necessary for any considerable production. The substance which I prefer to employ is hard rolled German silver containing from 18 per cent to 30 per cent of nickel. This substance can be purchased at a reasonably low cost, so that the molds or plates may be made entirely of the same without a prohibitive cost. It can be gotten

practically free from flawe and can be readily given a very high polish. Other alloys of nickel may be used, but the results obtained therewith are not as satisfactory as with Gorman silver. Monel metal, for example, which is an alloy of copper and nickel obtained from reducing certain cres. is very hard and satisfactory in most respects; but it cannot be gotten as free from flaws as German silver. Nickel plated brase may also be used; but the nickel coating ie apt to peel off when many times subjected to the necessary prossure for transferring the surface veneer to the article coated. Also by the process described in my U. S. Patent No. 734,522, nickel may be coated upon iron or steel by electrolytically depositing the nickel on the iron or steel and in then subjecting the nickel-plated iron or steel to a welding temperature in a non-oxidizing atmosphore; but the product obtained in this way cannot be finished to as good a surface as German silver.

The mold surface may be polished in any suitable way. Then employing German stiver, this composition is preferably obtained in the form of rolled plates which have a comperatively even surface. The mold surface is preferably first given a rough polish with emery and is then buffed off with eand and later with lime, the mold surface obtained in this way being as smooth as glass.

In order that my invertion may be better understood, attention is hereby directed to the accompanying drawing forming a part of this specification and in which the figure shows a central vertical sectional view illustrating the use of my improved molds or transfer plates in the molding of a sound record tablet. In the drawing, the numerals 1 and 1' designate two of the molds or transfer plates, the numerals 2 and 2' surface veneers formed on the plates 1 and 1', the numeral 3 the base or article to be coated, and the numerals 4 and 4' fillings of surface composition coated on the base 3 prior to the transfer of the veneers 2 and 2' thereto to facilitate the adherion of the surface veneers to the base. The numeral 5 designates the lower member of a suitable press. The plates 1 and 1' may be made of a thiokness of approximately one-sixteenth of an inoh or slightly more and are preferably formed with their peripheries slightly flanged so as to assist in the formation of the periphery of the molded article. Such 8

Having now described my invention, what I claim as new and decire to protect by Letters Patont of the United States, is as follows:

the surface of tablet mold having-a polished surface, the surface portion of said plate being formed of a metallic substance containing nickel, substantially as described.

- A record tablet mold having a polished surface and formed entirely of a metallic substance containing nickel, substantially as described.
- 3. A record tablet mold having a surface portion containing an alloy of nickel, substantially as described.
- 4. A record tablet mold having a polished surface, the surface portion of said mold being formed of an alloy of nickel, substantially as described.
- A record tablet mold formed entirely of an alloy of nickel, substantially as described.

Canceled 6/14/13

6. A record tablet mold having a polished surface and formed entirely of an alloy of nickel, substantially as described.

- 7. A record tablet mold having a surface portion of German cilver, eubetantially as described.
- 8. A record tablet mold having a policited surface, the surface portion of said mold being formed of German eilver, substantially as described.

To A record tablet mold having a polished surface and formed entirely of Gorman elver, but and tiply as described.

The A record tablet mold having a surface portion of Gorman silver containing at least eighteen per cent of nickel, substantially as described.

12. A record tablet mold having a polished surface, the surface portion of said mold being formed of German eilver containing at least eighteen per cent of nickely substantially as described. Remarker. Leavest 61 715/4

A rooord tablet mode formed entirely of Gorand entirely of Gorand entire of the formed entirely of Gorand entire of the formed entire o

4. A record tablet mold having a polished surface and formed entirely of Gorman effect containing at least the eighteen per cent of nickel, substantially as described.

Gautella (14.3)

15. A record tablet mold having a polished surface, the surface portion of said plate being formed of a

metallic substance free from flaws and containing nickel,

substantially as described.

16. A record tablet mold having a polished surface and formed entirely of a metallic substance free from flaws and containing nickel, substantially ac described.

Creek C. Claim 5 64/13 Creek B1 Linus 12,3 7/15/14 This specification signed and witnessed this soul day of afril 1912 Thomas A. Edison

Witnesseth:

1. Francis Backmans

Oath.

State of New Jersey \ ss., County of Essex

THOMAS A. UPISON , the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of blowollyn Park, Woot Orange, Ecoex County, New Jersey.

that he verily believes himself to be the original, first and sole inventor of the improvements in RECORD TABLET MOLDS

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two pears prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

Thomas A. Edison Sworn to and subscribed before me this Gott day of Chril 1912

[Seal]

Rotary Bublic.

15 Room ____ 308 _____

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE WASHINGTON JULY

Thomas A. Edison,

July 15, 1912.

c/o Frank L. Dyer,

Orange, N. J.

A 11 ...

. Please find below a communication from the EXAMINER in charge of your application.

for RECORD TABLET HOLDS, filed May 2, 1912, #694,658.

Commissioner of Patents.

This case has been examined.

The claims are rejected on

Dunne, #750,102, June 2, 1903 (18 - 47),

showing a nickel mold facing, or

McDonald, #366,176, July 5, 1887 (same),

nickel or German silver.

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
RECORD TABLET MOLDS,)
Filed May 2, 1912,)

HOHORABLE COMMISSIONER OF PATERTS,

S I R:

Serial No. 694,658.)

In response to the Office action of July 15, 1912, please amend the above entitled case as follows: In line 19, page 1, after "the" insert

- subsequent - .

In line 1, claim 9, after "mol3" inwort - or transfer plate - ; and in line 2, same claim, after "silver" insort - free from flaws - .

In line 1, claim 10, after "mold" insort

- or transfer plate - ; and in line 2, same claim, after
"silver" insort - free from flaws - .

In line 1, claim 13, after "mold" insert - or transfer plate - ; and in line 2, same claim, after "silver" insert - free from flaws and - .

In line 1, claim 14, after "mola" insert - or transfer plate - ; and in line 2, same claim, after "silver" insert - free from flaws and - .

Cancel claims 1 to 8 inclusive, 11, 12, 15 and 16, and change the numerals of claims 9, 10, 13 and 14 to 1 to 4, respectively.

Add the following claim:

- 5. A rocord tablet mold or transfer plate having a poliched surface and a flagged periphery and formed entirely of German silver free from flaws, substantially as described. -

REMARKS

The references cited by the Examinor have been carefully considered by the applicant, and the claims have been revised to point out more clearly the patchtable features of applicant's invention.

Neither of the references discloses a record tablot mold or transfer plate formed entiroly of German silvor free from flaws. In the process for which applicent'e invention is more particularly designed, the record composition is applied in fluid form to the surface of the transfer plate. In order to eliminate the tendency of the said composition to ashere to the transfer plate after hardening, it is necessary that the east plate be formed of a material free from flawe and capable of receiving a high polish. The transfer plate should also be capable of being repolished; and, as a thin surface coating or layer, such as described by Dunno, would soon be ground away in repolishing, the transfor plate shoul! be homogeneous or formed entirely of the same material. Applicant has found that German silver is the only substance which can be obtained free from flaws and with the other necessary qualities at a sufficiently low price to permit the commercial use of transfer plates formed entirely thoroof.

Claims 3 and 4 specify that the German silver contains at least 18% of nickel.

Claim 5, in addition to stating that the mold or transfer plate has a polished surface and is formed outirely of Germen silver free from flaws, differentiates from the references by stating that the mold or transfor plate has a flanged periphery.

The applicant has invented a new and improved article of manufacture, and reconsideration and allowance are accordingly respectfully requested.

Respectfully submitted,

THOMAS A. EDISON,

his Attornoy. Cycr.

Orange, New Jersey,

June /4, 1913.

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Div...15... Room.308...
Address only
"Two Commissioner of Palanta.

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All communications respecting this opplication should give the serial number data of filling, and ultic of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON _____Aug - 11, 1913.

Responsive to amendment filed June 16, 1913.

Claime 1 to 4 inclusive are rejected on the references of record. McDénald for instance notes explicitly the utility of german cilver as facing material for mold structure.

Claim 5 is rejected on

Mickerson #286,057 Sept. 18, 1883 (18-47) which shows a mold with polished surface and flanged periphery. Whether the surface layer be of nickel or german silver is immaterial as affects patentability. Both equivalents are shown in the art of record. See e. g. - MoDonald.

Proposition of the second of t

IN THE UNITED STATES PATENT OFFICE.

THOMAS A. EDISON,)
RECORD TABLET MOLDS,)
Filed May 2, 1912,)
Sorial No. 694,658.)

HONORABLE COMMISSIONER OF PATHWES,

SIR:

In response to the Office action of August 11, 1913, please amend the above entitled case as follows:

At the end of line 12, page 5, insert the

following sentence:

- The mold surfaces of the plates 1 and 1', as shown, are smooth and even from the center of the plates to their peripheries, so that there is no danger of the record material adhering to the mold surfaces -

Rewrite the claime as follows:

- 1. A record tablet mold or transfer plate consisting of a flat plate of German silver free from flaws and having a highly poliched over mold surface, extending over substantially the entire face.of.med-plate, substantially as described.
- 2. A record tablet mold or transfer plate consisting of a flat plate of German cilver free from flaws and having a flanged periphery and a highly poliched come mold currace, extending over embetantially the entire face thereof, substantially as described.
- 3. A record tablet mold or transfer plate consisting of a flat plate of Garmen cilver free from flaws and containing at least 18% of nickel, eaid plate having a highly poliched weem mold curricular have been mold curricular to over substantially

the entire face thereof, substantially as described.

REMARKS

It is thought that the references do not anticipate applicant's invontion, but the claims have been rewritten to more clearly define the invention. Applicant's problem as fully set forth in the specification is thought not to be contemplated in the references; and the features of the invention which adapt the same particularly for the solution of said problem are thought now to be brought out in the claims. All of the latter now specify a flat plate of German silver from flaws and having a highly polished even mold surface extending over substantially the entire face of the plate. Claim 2 also specifies that the plate has a flanged periphery, and claim 3 that it contains at least 18% of nickel. By reason of these limitations, the claims are thought to be clearly patentable. Referring to the patent to Mickerson cited by the Examiner in the last Office action, it is thought that a thin veneer could not be readily stripped off the irregular and uneven mold surface shown in the said patent without such injury to the moldod surface of the veneer as would be fatal to the surface of a sound record tablet.

It is thought that the claims are patentable, and reconsideration and allowence are accordingly respectfully requested.

Respectfully submitted, THOMAS A. EDISON,

By Shauk h. De

Orange, New Jersey, July /57 1914.

his Attorney.

FB_KCK

.... Sept. 3, 1914.....

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE WASHINGTON

U. S. PATENT OFFICE ... Frank L. Dyer. Orange, ... N. .. J. MAILED. Please find below a communication from the EXAMINER in charge of the application of

Thomas A. Blison ... serial No. #694,658 filed Nay 2, 1912 for Record Tablet Moldes ...

Responsive to amendment filed July 16, 1914. The claims are rejected for want of invention over the references of record.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison RECORD TABLET MOLDS Filed May 2. 1912

Room No. 308.

Serial No. 694,658

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of September 3, 1914, please amend the above entitled case as follows:-

Claim 1, line 3, cancol "oven", and after "surface" insort - free from projections and depressions and - .

Line 4, change "of said plate" to - theroof - .

Claim 2, line 3, cancel "even", and after "surface" insert - free from projections and depressions and - .

Claim 3, line 4, cancel "even", and after "surface" insert - free from projections and depressions and - .

REMARKS

The claims as presented are thought to patentably distinguish from the references. The patent to McDonald does not show a flat plate of the type specified in the claims. The patent to Mickewsen does not disclose a plate made of German silver, nor does it disclose a plate free from projections and depressions, as specified in the claims. The patent to Dunn does not disclose a plate of German silver nor does it disclose a plate of German silver nor does it disclose a plate having the flanged periphery specified in claim 2.

Reconsideration and allowance are requested.

Rosportfully submitted,

THOMAS A. EDISON
By Jrane L.

His Attorney

Orange, H. J.

July /4 , 1915

PB-JS

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Aur. 10 1915.

Frank L. Dyer,	U. S. PATENT OFFICE, AUG10 1915 MAILED.
Orange,	AUG10 1915
<u>u</u> , <u>J</u> ,	MAILED.
Please find below a communication from the EXAMINER i	n charge of the application of
Thomas A. Edison, Sorial No. 694,658, f	11ed-May 2, 1912, for
Record Tablet Polds.	
2	Thomas Twing
+ 4-000L	Commutationer of Potents.

In response to the amondment filed July 15, 1915: The claims are rejected on the references and for the reasons of record. As regards the flanged periphery construction, it will behaticed that this relationship is shown in Nickerson.

TH THE UNITED STATES PATENT OFFICE

Thomas A. Edison

RECORD TABLET MOLDS

Room No. 308.

Filed May 2, 1912 Serial No. 694,658

HOMORABLE COMMISSIONER OF PATEMES,

SIR:

In response to the Office action of

August 10, 1915.

The references of record have again been carefully considered, and it is thought that the same do not anticipate the claims. The invention is a very special kind of dovice which is not disclosed in the prior art, and it is thought that a patent should not be withheld upon the same merely because of its simplicity. Hone of the references shows a device intended for use as a transfor plate intended to receive a voneer which is subsequently welded or secured to a backing. It is not soon how the cylindrical tube D of Macdonald resembles the flat transfer plate of applicant. The patent to Dunne does not show a German silver transfer plate having a flanged poriphery. The device of Biokerson is very different from that claimed. Instead of being made with German silvor it is made with a soft base covered with a thin coating of nickel. In such a device, the nickel would poel off the base and render the mold entirely unsuited for the production of satisfactory

sound record tablets. Furthermore, the die of Nickerson is not a mold surface free from projections and depressions.

For the above reasons, reconsideration and allowance are respectfully requested.

Respectfully submitted,

THOMAS A. EDISON

By Frank L. Dycks

His Attorney

Orange, N. J. July 2/, 1916.

FB-JS

DIV. 15. ROOM 30

Allow only

"The Commissioner of Patents,
Weshiegies, D. C.,"

2-260

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

	WASHINGTONJuly_26,1916
	in, s. payent of
Frank I. Dyer,	
Orange,	
Rew Jorney.	N. A. 1 - 8 (0)
•	from the EXAMINER in charge of the application of
Thomas A. Edison, Serie	1 No. 694,658, filed Eay 2, 1912, for
Record Tublet Yolds.	
e 41001	Thomas Ewing Commissioner of Patents.
In management to the	e letter filed July 22, 1916;

In response to the letter filed July 22, 1916:

The claims are finally rejected upon the references and for the reasons of record.

IN THE UNITED STATES PATENT OFFICE

Thomas A. Edison RECORD TABLET ISOLDS Filed May 2, 1912 Serial No. 694,658

HONORABLE COMMISSIONER OF PATENTS,

SIR:

I hereby constitute and appoint DYSR & HOLKEN (Registration No. 3844), a firm composed of Frank L. Dyer and Deloe Nolden, shose address is Rdison Office Building, Orange, New Jersey, as my essociates in the prosecution of the above entitled application, and request that all correspondence be addressed to them until further notice.

Respectfully,

Frank L. Dyer.

Orange, H. J. January /0 . 1917.

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June 20, 1917

Mr. Edison:

Application Serial No. 694,658, Filed May 2,1912 entitled RECORD TABLET MOLDS.

This application covers the polished German eilver transfer plates formerly used by us in the manufacture of our disc records. The application has been finally rejected, and Mr. Holden and I think that it should be dropped because the device is no longer used by us, and also because it would probably be impossible to obtain the claims on same from the Patent Office.

Fleage advice if you wish to have the same dropped.

FB-EH

Patent Series Patent Application Files

Folio # 852 Electrical System for Automobiles

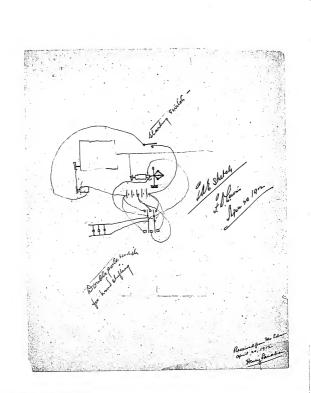
U.S. Patent #: 1192400

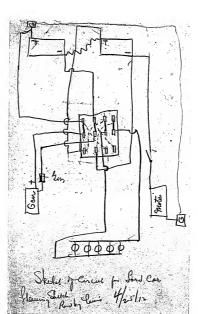
Primary Applicant: Edison, Thomas A

Date Executed: 5/20/1912

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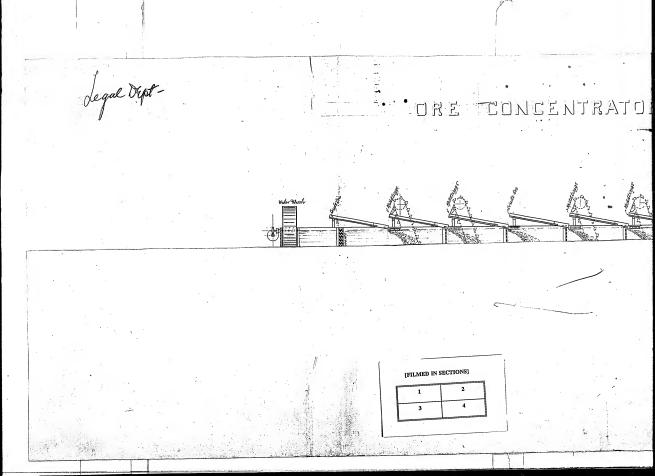
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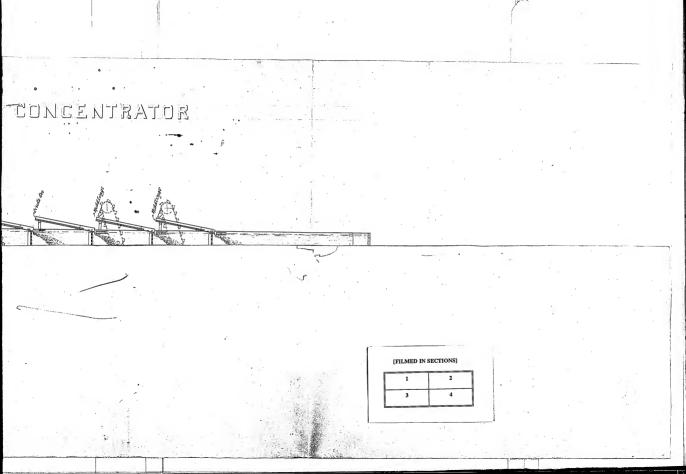
Folio # 853 Means for Concentrating Ores

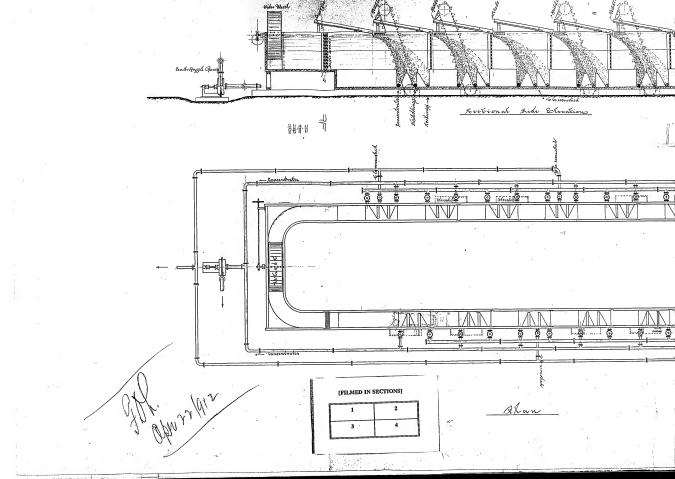
U.S. Patent #: 1167638

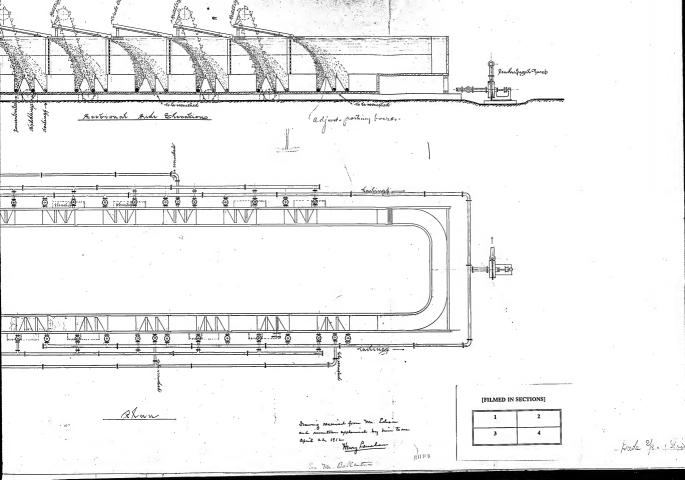
Primary Applicant: Edison, Thomas A

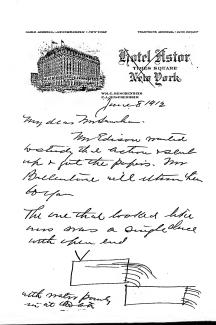
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Patent Series Patent Application Files

Folio # 861 Means for Charging Storage Batteries

Serial #: 704338

Primary Applicant: Langley, Sam G

Date Executed: 6/14/1912

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Applicant. Sam S. Langley	
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0	Counsel,
	Orange, New Jersey.
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Petition.

To the Commissioner of Patents:

Your Petitioner SAN C. LANGLEY
a citizen of the United States, residing and having a Post Office address at
#182 Valley Road, West Orange, Essex County, New Jersey

prays that letters patent may be granted to him for the improvements in

MEANS FOR CHARGING STORAGE BATTHRIES

set forth in the annexed specification; and he hereby appoints Frank L. Oper (Registration Lo. 560), of Orange, New Jersey, his attorney, with full power of substitution and revocation, to prosecute this application, to make atterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected theretwith.

Sam B. Laugley

SPECIFICATION

TO ALL WHOM IT HAY CONCERN:

BE IT KHOWN, that I, SAM C. LANGLEY, a citizen of the United States, and a resident of west Orange, in the County of Essax and State of Hew Jersey, have invented certain new and useful improvements in MEANS FOR CHARCING STORAGE BATTERIES, of which the following is a description:

My invention relates generally to means for charg ing storage battories, and particularly to apparatus and a system for charging such batteries in which one or more rectifying devices are employed to convert alternating current into uni-directional current which is supplied to the battery to charge the same. In a system of this character it is desirable to provide means for preventing discharge of the storage battery through the rectifying devices or other parts of the system in case of failure of current supply from the source or in case of abnormal decrease in voltage of the same. | One of the objects of my invention is the provision of an automatic switch constituting simple and efficient means for this purpose. Another object of my invention is the provision of apparatus constituting a complete charging set capable of boing compactly assembled and mounted, and adapted to be connected to a suitable source of alternating current and to a storage battery for charging the same. My invention includes also the combinations of elements and details of construction more fully described hereinafter and claimed.

moord D- 12-21-16

For the further description of my invention, reference is had to the drawings accompanying and forming part of this specification, and in which -

Figure 1 is a partly diagrammatic view of a charging system including a complete charging set embodying my invention connected to a source of alternating current and to a storage bettery;

Figure 2 is a vertical section of a simplified form of a roctifying device which I profer to employ in my improved system;

Figure 3 is a side elevation of my improved automatic switch, with the contacts closed;

Figure 4 is a plan view of the same, with the contacts open;

Figure 5 is a verticel view at right angles to the view of Figure 3, (the upper portion being sectional and the lower portion in elevation;) and

Figure 6 is a horizontal section on the line 6-6 of Figure 5.

My improved automatic switch is illustrated in Pigs. 3 to 6 inclusive. Referring particularly to these figures, at 10 is shown a supporting member which may be made of a single piece of sheat matal and which has a horizontal portion 11, portions 12 and 13 extending vertically upwards, (and a horisontal portion 14 extending outwardly from the upper and of the vertical portion 13). The supporting member 10 supports the parts of my improved automatic switch and may be secured to any suitable base member 15. If the base member 15 is of conducting material, the

supporting member 10 is preferably insulated therefrom, but if the base membor 15 is of insulating material, further in eulating means are not necoeeary in ecouring the supporting member 10 to the base member 15. On the horizontal portion 14 of the supporting member 10 a solsnoid is mounted, which includes a vortically disposed hollow spool 16 which may be made of metal and is preferably non-magnetic, and which is secured to the portion 14 in any suitable manner, as for example, by soldering. The spool 16 ie providsd with a high resistance sclenoid winding 17 suitably inculatsd from the epool. In the hollow core of the spool a plunger is provided, the lower portion 18 of which consists of magnetic material and is preferably of soft iron, and the upper portion 19 of which coneists of non-magnetic material, such as braes or copper, preferably hollowed out to reduce its weight. The upper non-magnetic portion of the plunger is provided with a shouldsr 20 or other suitable msans for limiting the downward movement of the plunger, and also with a vertical elot 22 through which passes a pin 21 soldsred or secured in any other suitable manner to the top of the spool 16 and eerving to limit the upward movement of the plunger. In the operation of the device, the pin 21 permits the plunger to rice to a pocition which ie substantially its position of equilibrium for the normal strongth of ourrent carried by the coil 17. By having the lower portion of the plunger of eoft iron and the upper portion of hollow non-magnetic material, the entire plunger is elevated to the decired pocition in the solenoid without necessitating the use of such an amount of iron as would

render the plunger unduly heavy, and greator sensitiveness of operation is thoreby statined. The lower end of the plunger is provided with a piece of insulating material 25 secured thereto to prevent the plunger from coming into electrical contact with the metallic sembor 56 upon which it impinges when it moves into lowered position.

On the upwardly extending vertical portion 13 of the supporting member 10 and beneath the portion 14 horizontal electro-magnets are mounted, the said electromagnets comprising magnetic cores 24 and 25, one end of cach core being secured to the portion 13 in any suitable manner, as for example, by sorews, the core 24 having a winding 26 surrounding it and insulated therefrom, and the core 25 having a winding 27 surrounding it and insulated therefrom. The ends of the cores 24 and 25 which are farthost from the portion 13 are provided with projecting pins of non-magnetic material constituting guides for an armature 30 of soft iron which is elongated in form and has openings near its ends to receive the guides 28 and 29. The armature 30 is provided with a member 31 preferably of non-magnetic material secured at right angles thereto and extending horizontally through an opening 32 in the upright portion 13, the said upright portion 13 thoreby constituting a guide for the On the portion of the member $\underline{\mathbf{31}}$ which extends through the upright portion 13 he a collar 33 or other suitablo means is provided for limiting the movement of the armature 30 away from the cores 24 and 25 of the electromagnets.

On the upwardly extending portion 12 of the supporting member 10 a contact 34 is mounted and suitably insulated therefrom. The contact surface of this contact faces the end of the member 31 which extends through the opening $\underline{32}$ on the upwardly extending vertical portion $\underline{13}$. The contact 34 is preferably a metallic disc or block and is provided with a reduced portion 57 extending through an opening in the upright portion 12, and with a threaded stem-97. The threaded stem is provided with a nut 35 which cooperates with the disc or blook 34 and with insulating washors to hold the contact in place on its support, and with washers 36 and a nut 35' which afford means for connooting the terminal) 34 in the hattery circuit. the upright portion 12 is also mounted a spring contact 37which consists of an elongated portion and end portions 39 and 38 bent back approximately parallel to the elongated portion when the contact is in closed position. portion 38 of the spring contact 37 is secured to the upwardly extending vertical portion 12 by any suitable means, as for example, a bolt and nut 40. At the end of the portion 38 an inturned projection 42 is provided which eqoperates with a slot 41 in the upright portion 12 to position the contact against rotary displacement around the bolt 40. The head of the bolt 40 co-operates with a washer to connect the contact in circuit. The end of the portion 39 of the spring contact 37 is split into a plurality of parts, which constitute contact faces co-operating with the contact 34, and insure adequate contact therewith.

On account of the resilioncy of the spring contact 37, the portions 38 and 59 tend to spring out of paralleliem with the elongated portion of the spring, whereby the portion 39 (is moved) away from the contact 34 as is illustraded in Fig. 4. When, howover, the windings 26 and 27 are energized, the armature 30 is attracted towards the cores 24 and 25, and the contacte 37 and 34 are forced into closed position by the end of the member 31. It is to be observed that the entire length of the spring contact 37, including the bent back portion 39, is effective in exerting pressure against the actuating member 31, and that, on account of the shape of the spring, this pressure is great when the armature 30 is in contact with or nearest the cores 24 and 25. The bent back portion 59 contributes materially to forcing the armature 30 away from the cores. which effectually overcomes any tendency of the armsture to etick to the cores.

A plate of insulating material/how one end servee as a support at its other end for a hellow tube 44, which is made of metal, as for example, brass, and which is scrow threaded at its lower end into the insulating plate 43. At the upper end of the tube 41 a plug 47 of insulating material is inserted, through which extends a conducting member 46 serve threaded at its upper end and provided with a contact 45 at its lower end. The upper end of the member 46 to provided with nuts 48 and 49 and weakers 50 phich serve to comment a conflator, the invent 49 envirages and the comment and a contact 45 in the comment and contact 45 and 49 and weakers 50 phich serve to comment a conflator, the circuit, the mut 49 corving also

to secure the member 46 in the insulating plug by co-operation with a headed portion at the other end of the said member 46. In the lower portion of the tube 44 and extending through the bottom thereof and through the insulating plate 43 is an elongated member 52 provided at its upper end with a contact 51 and screw threaded at its lower A coiled spring 59 encircles the member 52 within the hollow cylinder and is located between a shoulder on the upper portion of the member 52 and a shoulder in the lower portion of the tube 44, thereby tending to elevate the member 52 and to force contact 51 into contact with the contact 45. A bracket 54 is held in place on the insulating plate 45 by the cylinder 44, the lower end of the cylinder being extended through a portion of the bracket lying on the upper surface of the insulating plate 43. et 54 is insulated from the horizontal supporting portion 14 by the insulating plate 43. The bracket 54 is provided with lugs 55, upon which an elongated member 56 of light weight, which may be made of fairly stiff sheet metal, is pivotally supported. The member 56 has an opening through which the lower end of the member 52 passes loosely, and nuts 53 are provided at the lower end of the member 52 and beneath the elongated member 56 in such a manner that the elongated member 56 is supported in an approximately horizontal position and its free end is located immediately beneath the insulsting block 23 of the plunger 18. Upon failure of ourrent or abnormal decrease in current strength of the coil 17, the plunger 18 drops by gravity and impinges upon the free

and of the pivoted member $\underline{56}$, thereby depressing the member $\underline{52}$ against the action of the spring $\underline{59}$ and separating the contacts $\underline{45}$ and $\underline{51}$. The brackst $\underline{54}$ is provided with a series and washer $\underline{58}$ for commecting the brackst in circuit. It will be observed that the brackst $\underline{55}$ is in electrical commection with the tube $\underline{44}$ and the contact $\underline{51}$.

In Figure 1, in which a complete charging set smbodying my invention is illustrated, $\underline{72}$ and $\underline{73}$ are terminals adapted to be connected to alternating current mains $\underline{70}$ and $\underline{71}$ respectively which are supplied with alternating ourrent from any suitable source. Terminals $\underline{84}$ and $\underline{85}$ ars provided, which are adapted to be connected to a storage battary and are shown connected to the storage battery $\underline{86}$. At $\underline{74}$ and $\underline{75}$ respectively are shown the primary and secondary of a transformer, suitably designed to transform the ourrent from the source 70 and 71 to a voltage suitable for charging the storage battery. The terminal 72 is connected to a junction point 76, to which one terminal of the primary winding 74 is connected. The other terminal of the primary winding is connected to one terminal of an adjustable rheestat 78, the other terminal of the rheostat being connected to a junction point 77. junction point 77 is connected to a contact 79 of a double pole manually operated switch 82, which is provided with a contact 80 adapted to be connected to the contact 79 by the switch blade 81 and with contacts 87 and 88 adapted to be connected together by the switch blads 89. 81 and 89 are provided with a common handle for opening and closing the switch. The switch contact 80 is connected to the terminal $\underline{73}$. When the switch $\underline{82}$ ie closed, the primary 74 of the transformer is connected across the alternating ourrent mains 70 and 71 through the switch blade 81 and the adjustable rheostat 78. A suitable rectifying device or devices are provided. I have illustrated four such devices \underline{A} , \underline{B} , \underline{C} and \underline{D} , which are proferably of the type of rectifying devices described and claimed in my application Scrial Ho. 702,187, filed June 7, 1912. of these rootifying devices includes a permanent magnet 60 having an almost closed magnetic circuit. In the gap of the magnetic circuit of the permanent magnet $\underline{60}$ one or more soft iron armatures 61 and 62 are pivotally mounted at their lower ends on the permanent magnet or on a suitable frame which may also be used for supporting the magnet. Armatures 61 and 62 are provided at their upper onds with euitable contacts 63 and 64 respectively which are preferably of carbon. The vibrating contacts 63 and 64 co-operate with the stationary contact 65. Surrounding the armatures 61 and 62 is an actuating coil 66. When the actuating coil ie supplied with alternating ourrent an alternating magnetic flux is set up in the soft iron armatures 61 and 62, making of their upper ends alternately north and south poles. Whom the upper ends of the armatures are north poles, the south pole of the permanent magnet is strengthened and the north pole is weakened, and vice versa. The armaturee are therefore vibrated in synchronism with the alternating current in the actuating coil and open and close a circuit containing the etationary contact 65 and the vibrating contacts 63 and 64. The vibrating contacts 63 and 64 are

connected together through the armatures and their supporting means, including the permanent magnet or the frame. In the system illustrated, the actuating coils of the devices A, B, C and D are connected in series by a conductor extending from the junction point 76 through a condenser 83 to the junction point 77. The actuating coils are thersfore connected in sories across the terminals 72 and 73 and across the alternating current mains 70 and 71 whon the terminals 72 and 73 are connected to the mains. The condensor 85 is adjusted so as to advance the phase of the current in the actuating coils to a sufficient extent to components for the inductance of the coils and for the inertie of the armstures, and to insure the making and breaking of the rectifying circuits at the proper times to reduce or substantially prevent sparking. One terminal of the ssoondary 75 is connected by conductor 90 to the terminal 84 which is connected to the storage battery 86, and the other terminal of the secondary 75 is connected by a conduotor 67 to the spring contact 37 of the automatic switch. The fixed contact 34 of the automatic switch is connected by conductor 93 to the armatures and vibrating contacts of two of the rectifying devices, as for example, the dsvices A and C. The fixed contacts of the rectifying devices A and C are connected to the vibrating contacts and armatures of devices \underline{B} and \underline{D} by conductors $\underline{68}$ and $\underline{69}$ respectively. The fixed contacts of the devices \underline{B} and \underline{D} are connected together and to the contact 88 of the manually operated switch 82 by means of conductor 92. The contact

 $\underline{87}$ of the manually operated switch $\underline{82}$ is connected to the terminal 85 by conductor 91, the terminal 85 being connected to the storage battery 86. The winding 17 of the solen oid is connected between the junction points $\underline{76}$ and $\underline{77}$ and is therefore connected across the terminals $\underline{72}$ and $\underline{73}$ and . alternating current mains 70 and 71 connected thereto through switch blade 81 of manually operated switch 82. tro-magnet windings 26 and 27 are connected in series across the battery terminals and in series with contacts 45 and 51the circuit being as follows:- From terminal 84 through conductor 94 to magnet winding 27, through magnet winding 26, conductor 95, bracket 54, cylinder 44, contact 51, contaot 45, conductor 96, the conductor 96 being in electrical connection with the fixed contacts of rectifying devices $\underline{\mathbf{3}}$ and $\underline{\mathbf{D}}$, which contacts are in electrical connection with terminal 85 through conductor 92, switch contact 88, switch blade 89, switch contact 87 and conductor 91.

The operation of the system is as follows:when the torminals 72 and 73 are connected to mains 70 and
71 auplied with alternating oursent and the switch 82 is
closed, the sclonoid winding 17 is onergized, the core 18
is clevated into its upper position, and the contacts 45
and 51 are permitted to close. The magnet windings 25 and
27 are then energized from the storage battory (ex. 197 root4
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ture 30 is attracted to the cores 24 and 25, contacts 37
and 34 are closed by the notion of the member 31 sourced to
the armature 30, and the chattery is connected in oriouit
with the rectifying system, (The armatures of the rectify-

While the butter is saing though it is the tipmy supetime. Software with the battery his supplying business to the new 25 and 25 and 25

ing devices are vibrated in synchronism with the alternating current to be roctified, and the contacts of each device are closed during alternate half waves of alternating ourrent and opened during the remaining half waves. The path of the rectified ourrent is as follows:- Starting at the left hand end of the secondary 75, through conductor 90, to terminal 84, through storage battery 86 to terminal 85, through conductor 91, switch contact 87, switch blads 89, switch contact 88, conductor 92, to the fixed contacts of rectifying devices B and D. At this point the current divides, one path being through contacts and armatures of rectifying device B, through conductor 68 to contacts and armatures of rectifying device A, and to conductor 93; the other path being through contacts and armatures of rectifying device D, conductor 69, contacts and armatures of rectifying device C, to conductor 93, and uniting with the other branch of the circuit, and thence through conductor 93 to fixed automatic switch contact 34, spring contact 37, conductor 67, and back to the right hand end of the secondary 75 of the transformer. In this manner unidirectional current is supplied to the battery to charge the same, and the strength of the charging current may be regulated by the adjustable rheostat 78 in circuit with the Insurf 2 /34/14 primary 74 of the transformer. A If for my cause there is a failure of the current supplied to the alternating ourront mains, or if the voltage drops abnormally, for example, to such an extent as to reduce the voltage of the charging current below the battery voltags, the plunger of the solenoid will be permitted to drop, impinging upon the member

(56, and separating contact 51 from contact 45 against the action of the spring 59, the tension of the spring 59 and weights of the member 56 and the plunger of the selenoid being properly proportioned to produce this result. separation of contacts 51 and 45 causes, the circuit through the magnet windings 26 and 27 to be broken, and the resiliency of the spring contact 37 forces the armsture 30 away from its core and soparates contact 37 from contact 34, thereby broaking the circuit (between the battery and the rootifying devices, and preventing any possible discharge from the battery through the rectifying devices. When current comes on again in the mains 70 and 71 or the voltago rises to the required amount, the solonoid winding 17 is immediately energized, the core 18 elevated out of contaot with the member 56, permitting the closing of the contaots 51 and 45, thereby closing the circuit through the magnot windings 26 and 27. Which causes the cores 24 and 25 to attract the armature 30 and thereby close contact 37 against contact 34, thus re-ostablishing the (connection between the rectifying devices and the storage battery. viously, oponing the hand operated switch 82 do-energizes the solenoid winding 17 and causes the battery circuit to be opened at contacts 37 and 34. Furthermore, when the hand operated switch 82 is opened, there is no sparking at the contacts of the automatic switch because the circuits are broken first at the hand operated switch.

By having the plunger 18 disconnected from the contact which it is to operate, the evil effects of chattering, which are liable to occur in alternating current

apparatus, are obviated. That portion of the davice inoluding the sciencial winding 17 and the contacts 45 and 51 acts as a ralay for the slectro-magnets 26 and 27 which control contacts 34 and 37 corrying large coursents. In my improved apparatus I am enabled to combine sensitiveness and positiveness of action, and no chattering whatever coours.

Having now described my invention, what I claim as new therein and desire to protect by Letters Patent is as follows:-

- 1. In a system of the class described, the combination of a storage battery and means for supplying unidirectional current thereta, including a source of alternating current, restifying means, and means controlled by the add source for controlling the connection of the battery to the rectifying means, abstantially as described.
- 2. In a system of the class described, the combination of a storage battery and means for supplying unidirectional current thereto, including a source of altermaintaining the commercion of the battery to the rectifying means while the voltage of the source is in excess of
 a predstormined value and for breaking the commection when
 the voltage of the source falls below said value, substantially as described.

- 3. In a cyctem of the clase described, the combination of a storage battery and means for charging the ease, including a source of alternating current, rectifying means a manually operated ewitch, and an automatic ewitch governed by the voltage of the source for controlling the commection and disconnection of the battery and rectifying means, said automatic ewitch being operable to connect the battery and rectifying means only when the manually operated ewitch is closed, substantially as described.
- 4. In a system of the class described, the combination of a storage battery and means for charging the earn, including a transformer having primary and secondary windings, rectifying means, an automatic ewitch having a winding supplied with ourrent from the primary and having contacts controlled by said ewitch winding for making and breaking connection between the battery and the rectifying means, and a manually operated ewitch for controlling the automatic ewitch circuit and the battery connection, substantially as described.
- 5. In apparatue of the class described, a fixed contact, a covable contact se-operating therewith, a selencid, and a plunged for the selencid for controlling the movable contact but discommented therefrom, substantially as described.
- 6. In apparatue of the clase described, a stationary contact, a movable contact spring-pressed into circuit

closing position, a member loosely connected with said movable contact for moving the same out of circuit closing position, a solencid, and a plunger held free from said member when the solencid is energized, but located to impinge upon said member when the solencid is de-energized to cause apparation of the fixed and movable contacts, oubstantially be described.

In apparatus of the class described, an insulating plate, a hollow cylinder mounted on one end thereof and vertically disposed, a stationary contact mounted on tho upper end of the cylinder and insulated therefrom, an elongated member extending through the bottom of the cylinder and the insulating plate and having in its upper and a contact adapted to co-operate with the fixed contact, a spring for closing said contacts, a pivoted member operatively related to the movable contact-carrying member so that when the free end of the pivoted member is depressed the movable contact is separated from the fixed contact, a solenoid mounted vertically on said insulating plate, and a gravity-actuated plunger for the solenoid located to impinge upon the free end of the pivoted member when the current in the solenoid is reduced a predetermined amount, substantially as described.

a. In apparatus of the class described, fixed and movable contacts, a solenoid having a gravity actuated plunger unconnected to said contacts but located to separate the same when the solenoid is de-energized, and an electro-magnet having its circuit controlled by said contacts, substantially as described.

9. In appearatus of the class described, fixed and movable contacts, a solenoid having a gravity actuated plunger unconnected to said centacts but located to separated the same when the solenoid is de-conrectived, (an cloctro-magnet having its circuit controlled by said contacts, and an additional contact controlled by said electro-magnet, substantially, as described.

10. In apparatus of the class described, a vertically disposed solenoid and a plunger therefor having its lower
portion of magnetic and its upper portion of non-magnetic
material, substantially as described.

11. In apparatus of the class described, a vertically disposed solenoid and a plunger therefor having its lower portion of magnetic and its upper portion of non-magnetic material, said plunger having means for limiting its downward morement, substantially as described.

12. In apparatus of the class described, a vertically disposed solenoid and a plunger therefor having its lowor portion of magnetic and its upper portion of non-magnotic
material, said plunger having means for limiting its upward
and domward movements, substantially see described.

13. In apparatus of the class described, a verticelly disposed solenoid and a plunger therefor having its lower portion of magnetic and its upper portion of non-magnetic material, said plunger having means for limiting its downward movement, and having an insulating member scowed, to its lower end, substantially as described.

14. In appearatus of the class described, a spring contact having a contral elegated portion and ends being back toward each other, one of said ends being split to form a facilitic content feet, substantially as described.

15. In apparatus of the class described, a supporting member, a pdir of cleatro-magnets supported horizontally thereon, an armature for the electro-magnets, guiding means for the cruenture, and a horizontally disposed extension on the electro-magnet having its free end extended through the supporting member a substantially as described.

16. In apparatus of the class described, a supporting member, a pair of clostro-magnets supported horizontally thereon, an armature for the electro-magnets, guiding means for the armature, a fixed content and a movable contact cooperating therewith and normally tissed out of circuit closing position, and a horizontally disposed extension on the clostro-magnet adapted to engage the movable contact and force it into circuit closing position when the electromagnets are onergized, substantially as described.

17. In apparatus of the oldes described, the combination of a stationary contact, a spring contact mounted to co-operate therewith and normally biased out of contact therewith, a member located to engage taid spring contact to move it into circuit closing position and including an armature, an electro-magnet for moving said member into contact engaging position, contacts normally biased to closed position for controlling (the circuit of said electro-magnet, a pivoted member operatively connected (to one ver) said cirout-controlling contacts a sciencia, and a plunger therefor, the said plunger being located to impinge upon the free and of the pivoted member to open said circuit-controlling contacts when the sciencia in de-energized, substantially as described.

Frank B. (leims 5 and 6 4-9 1).

Shout C- Claim 1. newather 16/10/16.

C'- Claim 7- 4/5/16

This specification signed and witnessed this 14th day of home 1912 Sam & haugley Wlitnesseth: 1. Henry hanahan 2. Anna P. Klehm

Oath.

State of New Jersey \ 55., County of Essex

, the above named SAM G. LANGLEY petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and a resident of Wost Orange, Essex County, New Jersey

that he verily believes himself to be the original, first and sole inventor of the improbements in

MEANS FOR CHARCING STORAGE BATTERIES

described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or patented in any country foreign to the United States on an application filed more than twelve months prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent upon said invention has been filed by him or his legal representatives or assigns in any foreign country.

ntatives or assigns in any foreign country.

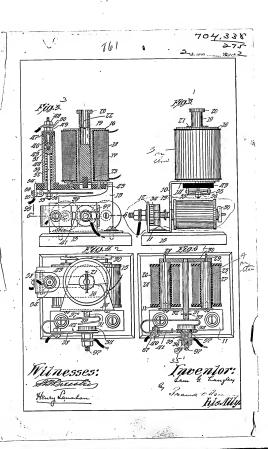
**Sam S. Laugley

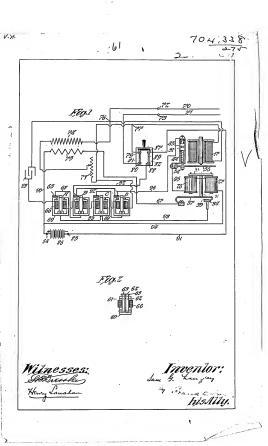
**Subscribed before me this 114th day of June 1912

**Fund P. Velelum

Botary Amblic.

[Seal]





Div. 26... Room ... 195

"The Commissions of Peters,
Washington, D. C."

2-200

Paper No.....2.....
All communications respecting this spoilcation should give the serial number, date of filler, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Februs

February 4, 1913.

Sam G. Langley,

Serial No. 704,338.

Frank L. Dyer, Orange, H. J. F W 161 00

Please find below a communication from the EXAMINER in charge of your application. for Meane for Charging Storage Batterice, filed June 18, 1912,

EBMsore!

If applicant's full first name is "Sam", affidavit to that effect should be filed. If that is not his full first name the correct name should be inserted in the preamble to the specification.

The numerals 30 and 31 chould be placed on Fig. 1. It is not eeen how the current could be supplied from the rectifying eyeten as stated on page 11, line 25, before the switch 37 is closed.

A plurality of inventions are claimed in this application. Claime 1 to 4 are drawn to a system classifiable in 171-5yetome, Secondary Entery. Claims 5 to 13 are drawn to an electromagnetic ewitch for the contacts 51 and 45. This device seems to be independent in ite mode of operation from the system and is classifiable in another subclass of this Office. Claims 14 to 17 are drawn to still another electromagnetic ewitch, which is considered to be an independent device.

Division is required along the lines suggested.

CEIVED

C. H. WILSON.

IN THE UNITED STATES PATENT OFFICE

Sam C. Langley
MEANS FOR CHARGING STORAGE
BATTERIES

Room No. 105

Filed June 18, 1912 Serial No. 704.338

HOUGRABLE COMMISSIONER OF PATENTS.

SIR:

In response to the Office action of February 4, 1915, please amend the above entitled case as follows:-

Page 11, lines 24 and 25, concel "or by rectified current supplied from the rectifying system".

Page 12, line 24, after "transformer," insert the sentence - While the bettery is being charged, the rectifying system co-operates with the bettery in supplying current to the magnet windings 26 and 27.

The Examiner is requested to apply in Figure 1 the reference numeral 30 to the armsture and the reference

the reference numeral 30 to the armsture and the reference numeral 31 to the member secured at right angles to the armsture.

Cancel claims 5 to 17 inclusive.

REHARKS

Claims 5 to 17 inclusive have been canceled in compliance with the Examiner's requirement of division.

Applicant reserves the right to file a divisional applica-

tion or applications on the subject matter of the claims canceled.

Action on the morits is requested.

Respectfully submitted,

SAM G. LANGLEY

. By Frank L. Slyer
His Attorney

Orange, New Jersey January 3/ , 1914

HL-JS

STATE OF NEW JERSEY)
COUNTY OF ESSEX)

SAM C. LANGLEY, whose application for Letters Patent for MRAHS POR CHARCING STORAGE BATTERIES, Sorial No.704,339, was filed in the United States Patent Office on or about the 18th day of June, 1912, being duly sworn, deposes and says that his full first name is "Sam".

Som G. Langley

Sworn to and subscribed before me this 3/2 day of January, 1914

Alary & Laidlaw

(seal)

Div.26. Room ...105
Address only
"The Commissioner of Patents,
Washington, D. C.,"

VOC

E.

e 6--260

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

April 29, 1914.

Frank L. Dyer,	S. PATENT OFFICE
Orange,	(APR 29 19]4)
New Jersey.	MAILED.
Please find below a communication from the EXAMINER in ci	harge of the application of

Sam 6. Langley, Serial No. 704,558, filed June 18, 1912, for Weane for Charging Storage Batteries.

Thomas Enry

In response to amendment of Feb. 2, 1914.

The numerale "50" and "31" have been applied to Fig. 1 as requested. The numeral "18" chould also be applied to this

Inasmuch as applicant has elected to claim the system, the figures on sheet 2 should be cancelled, together with their description.

Claim 1 is rejected on Maxim, 742,886, Nov. 3, 1903, Systems, Secondary Battery.

The other claims are allowed.

IN THE UNITED STATES PATERT OFFICE

Som G. Langley
MINING FOR CHARGING STORAGE BATTERIES
Filod Juno 18, 1912 Room No. 105.
Serial No. 704,558

HONORABLE COMMISSIONER OF PATENTS,

SIR:

In response to the Office action of april 29, 1914, please amend the above entitled case as follows:-

 $\label{eq:claim-1} \mbox{Claim 1, line 5, before "said" invert - voltage} \\ \mbox{of -.}$

Add the following claims: -

- 5. In a system of the class described, the combination of a storage buttery and means for supplying unidirectional current thereto, including a source of current, rectifying means, and means for automatically establishing connection between said storage buttery and said rectifying means whenever a predetomined electrical condition exists in said source, substantially as described.
- 6. In a system of the class described, the combination of a storage battery and means for charging the same, including a source of alternating current, rectifying means, and contacts for making and breaking commection between the battery and the rectifying means, said contacts being automatically moved relatively to each other into

circuit making or breaking position according to the electrical condition of said source, substantially as described.

REMARKS

The Examiner is requested to withdraw the requirement that the figures on shoot 2 be canceled. These figures aid materially in a clear and ready understanding of the specific system in which the invention is shown as embedied, and contribute to the explanation, required by statute, of the best mode in which applicant has contemplated applying the principle of his invention. The cancellation of these figures would necessitate a considerable revision of the specification and probably amendments to Pigure 1 of the drawing, inasmuch as this figure is largely diagrammatic. It is not believed that the reference numeral 18 should be applied to Figure 1, inasmuch as this reference numeral designates morely the lower portion of the core, and in Figure 1 to line of demarcation is shown between the upper and lower portions of the core.

Claim 1 has been amended to distinguish from the patent to Maxim cited, by reciting that the connectioncontrolling meens is controlled by the <u>valtage</u> of the source.

In the patent to lixxim, the under load circuit breakors 7 and 7e are not self-restoring but must be reset by head, whereas in applicant's system the conscious between the storage bettery and the rectifying means is nutematically established wherever a predetermined electrical condition exists in the source, and the contacts

for making and breaking connection between the battery and the rectifying means are submissically moved relatively to each other into circuit making or breaking position coording to the electrical confition of said course. One or the other of these distinctions appears in each of new claims 5 and 6, and these claims are believed to be clearly patentable.

Reconsideration and allowance are requested.

Respectfully submitted, SAM G. LANGLEY

By Frank L. Slyer

His Attorney

Orange, N. J.

April 9 , 1916

HL-JS

Div. 26 Room 105

DEPARTMENT OF THE INTERIOR UNITED STATES PATENT OFFICE

WASHINGTON June 22, 1915.

Frank L. Dyer. Orange.... New Jersey.

Please find below a communication from the EXAMINER in charge of the application of S. G. Langley, filed June 18, 1912, for Means for Charging Storage Butteries. Ser. No. 704.338.

In response to amendment filed Apr. 10, 1915, Claims 1, 5 and 6 are rejected on Scheibe, (959,513) May 31, 1910, Systems, Sec. Bat. or Scheibe, 959,544, May 31, 1910, In explanation, it may be stated that the tilt-Systems, Sec. Bat. ing coils 21 and 23 of the references which serve to establish connection within the rectifier are thought to be equivalent to means for establishing connection between the storage battery and rectifying means.

959,513 at med have been exterior on 959,613.

Examiner - Division 26.

IN THE UNITED STATES PATENT OFFICE.

Sam G. Langley

MEANS FOR CHARGING STORAGE BATTERIES

Filed June 18, 1912

Room No. 105.

Serial No. 704,338

Hon. Commissioner of Patents.

SIR:

In response to the Office action of June 22, 1915, please amend the above entitled case as follows:

Rewrite claim 1 as follows:

1. In a system of the clase described, the combination of a eterge bettery and means for supplying unidirectional current thereto, including a course of alternation ing current, rectifying means, and means controlled by the voltage of ead source for connecting said battery to said rectifying means, substantially as described.

Add the following claim:

7. In a eyetem of the clase described, the combination of a etorage battery and means for charging the same, including a source of alteracting current, a transformer, rectifying meane, a connection between the rectifying meane and the battery, a connection between the transformer and the source of current, an automatic switch having a winding supplied with alternating current from the source and having contacts controlled by said winding in the connection between the battery and the rectifying means, and a manually operated switch for simultaneously controlling said connections and the automatic switch winding, substantially ac described.

REMARKS

The patent to Scheibe was evidently incorrectly cited by the Examiner and should have been cited as Mc. 959,613. This patent shows a rectifying system in which a mercury vapor rectifier is employed. Mercury vapor rectifying devices cease to operate if the alternating current circuits are broken or if the supply of energy is temperarily interrupted for any cause. Such devices are restarted by tilting the rectifier bulbs and in a system of thie kind it is necessary to provide means for retilting the above bulb when the current supply fails, and this is the principal object of the Scheibe patent. In applicant's system, the problem is quite different inasmuch as the type of rectifier used in applicant's system is selfstarting, but means must be provided for interrupting the direct current circuit in order to prevent the discharge of the battery through the rectifying devices if their contacts should happen to be in closed position when the devices cease to operate. In applicant's system, means is provided for automatically opening the battery circuit when the alternating current supply fails or falls below a predetermined value. In the Scheibe patent, connection within the rectifier is established, when the bulb is tilted, from the starting terminal 27a through the mercury to the direct current terminal 14. These elemente, however, form a nececcary part of the rectifying device. The patent to Jackson and Scheibe, No. 959,544, chowe a cimilar eyetem and the discussion of the Scheibe patent applies also to the Jackeon and Scheibe patent.

While claim 1 as formerly presented is not believed to be met by either of these patents, the claim has been rewritten in order to distinguish from these patents more clearly, and in the claim as rewritten there is recited "means controlled by the voltage of said source for connecting said battery to said rectifying means" and the means so described is in addition to the rectifying means. It is believed that this claim distinguishes clearly from the patents discussed above inasmuch as that in these patents there is no element in addition to the rectifying means constitutin: "means controlled by the voltage of said source for connecting said battery to said rectifying means".

Rooonsideration of the rejection of claims 5 and 6 is requested. Claim 5 recites "rectifying means, and means for automatically establishing connection between said storage bettery and said rectifying means whenever a predetermined electrical condition exists in said source". The patents discussed above do not show the second mentioned means in addition to rectifying means. Similarly in claim 6 in addition to the rectifying means there are recited "contacts for making and breaking connection between the battery and the rectifying means, said contacts being automatically moved relatively to each other into circuit making or breaking position according to the electrical condition of said source". The Scheibe patents do not show such contacts in addition to the rectifying means.

Hew claim 7 clearly distinguishes from the Scheibe patents by reciting "a connection between the rectifying means and the battery" and contacts controlled by the automatic switch winding in the connection between the battery and the rectifying means. This claim also distinguishes from the patent to Maxim, previously cited, in setting forth that the automatic switch has a winding supplied with alternating current from the source and has contacts controlled by said winding in the connection between the

battery and the rectifying means, and in reciting a manually operated switch for simultaneously controlling the battery and source of current commections. One advantage of applicant's system is that by opening the menually operated switch the rectifying apparatus is simultaneously disconnected from the outside source and the battery, and since the break in the direct current circuit occurs at the manually operated switch before it occurs at the contacts of the automatic switch, there is no sparking at the contacts of the automatic switch and these contacts are therefore protected. See page 18 of the specification, lines 23 to 26 inclusive.

The claims now presented are believed to be vatentable, and reconsideration and allowance are requested. Respectfully submitted,

BAM G. LANGIFY
By Frank L. Dyer

His Attorney

Orangs, N. J. June /5, 1916 IN THE UNITED STATES PAGENT OFFICE

Sam G. Langley

MEANS FOR CHARGING STORAGE BATTERIES

ALIENDET NT UNDER RULE

Filed Juno 18, 1912 Serial No. 704,358

Allowed July 22, 1916

HONORABLE COMMISSIONER OF PATERTS.

SIR:

Please amend the above entitled case under Rule 78 without withdrawing the same from issue, as follows:-

Insert the following paragraph at the end of

page 1: -

5

My copending applications Serial No. 136,78k,

filed December 13, 1916, and Serial No. 136,781, filed December 13, 1916, ere divisions horsof and contain claims cevering the automatic switch device. -

Page 4, line 25, cancel "is". Page 8, 14ne 5, change "55" to - 54 - .

REMARKS

The Examiner is respectfully requested to change the reference character 35 applied to the outer nut on rod 97 in Figure 6 of the drawings to 35'.

The present amendment is made morely for the purposes of correcting certain informalities and for making

reference to two divisional applications. It is accordingly requested that the Examiner recommend the admission of this amendment.

Respectfully submitted,

SAM G. LANGLEY

By Frank X. Oyur.

Orange, N. J.

December 24 , 1916

WH-JS

Serial No. 704.538

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON July, 22, 1916

Sam.G. Langley, Assor.

Sir: Your APPLICATION for a patent for an IMPROVEMENT in

Means for Charging Storage Batteries.

filed June, 10, 1912, has been examined and ALLOWED.

The final fee, TWENTY DOLLARS, must be paid not later than
SIX MONTHS from the date of this present notice of allowance. If the final fee be not paid within that period, the patent on this application will be withheld, unless renewed with an additional fee of \$15, under the provisions of Section 4897 Revised Statutes.

The office delivers patents upon the day of their date, and on which their term begins to run. The printing, photolitho-graphing, and engrossing of the several patent parts, prepara-tory to final signing and sealing, will require about four weeks, and such work will not be undertaken until after payment

of the necessary fee. When you send the final fee you will also send, DISTINGTLY AND PLAINLY WRITTEN, the name of the INVENTOR, TITLE OF INVENTON, AND SERIAL NUMBER AS ABOVE GIVEN, DATE OF ALLOWANGE

(which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of FIVE CRMTS EAGH. The money should accompany the order. Postage CENTS EACH. The money should stamps will not be received.

Final fees will NOT be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office. Respectfully.

Frank L. Dyon

New Jersey

DEPARTMENT OF THE INTERIOR. United States Patent Office.

In re application,
Sam G. Langley,
"Means for Charging
Storage Enteries,"
Filed June 18, 1912,
Serial No. 704,338.

Before the

Hon. Commissioner of Patents.

On Patition.

CAN UISIT

Examiner's Statement.

It is recommended that the petition to smend the above entitled application under Rule 78 be granted, but that the serial number given as *136,781* in line 2 of the amendment which it'is proposed to insert at the end of page 1 be changed to 136,783 by significate amendment, before entry of the proposed

Respectfully submitted,

Braminer. Division 26.

Washington, D. C., January 4, 1917. ADDRESS ONLY THE COMMISSIONER OF PATENTS WASHINGTON, D. C. 2-403

LETTER No.

TEG

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Jamuary 6, 1917.

In the matter of the Application of Sem G. Langley Neans for Charging Storage Batteries; Filed June 18, 1912 Serial No. 704,338.

Amendmen t.

Sirs

You are horeby informed that the recommendation of the examiner that the anondmont be admitted under the provisions of Rule 76, a copy of which was mailed to you under date of the 14th instant, has been approved by the First Assistant Commissioner and the amendment entered.

By direction of the Commissioner: Very respectfully,

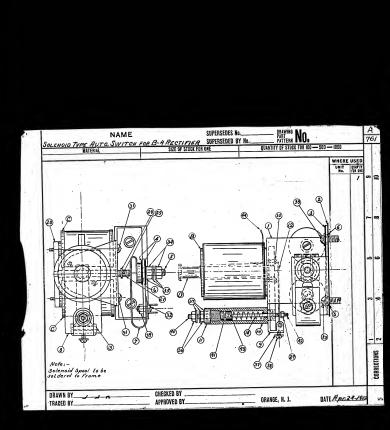
Chief Clerk.

Sam G. Langley o/o Frank L. Dyer, Orange, H.J. Folio____

STATEMENT OF INVENTOR

Invention automatic No-voltage Release
Conceived on
Disclosed topics Stoffy Date 143/1/2
" "DM Blice " Tet 5, 1912
Made drawing Setul drawing on the mitter Finished on Marke-12
Model or complete working device started J. J. 62, 1912
Finished on 12 / 3 / 9/2
Is the invention in use?
- e (e.c. e
General Description of Complex.
Invention.
- + 1 to main line beafer.
a solved consisted to main him hufer
to a ming changing current
bottom (The wollage fronte, circuit to he
in opened, automatically closing again when
main line voltage is re-established.
Received by Date
Inventor
Remarks

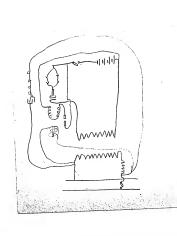
This statement, together with sketch, to be put in the application file.



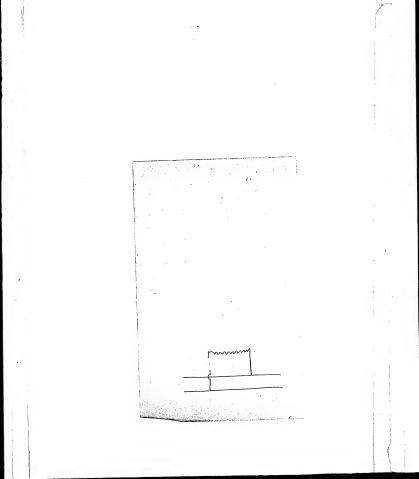
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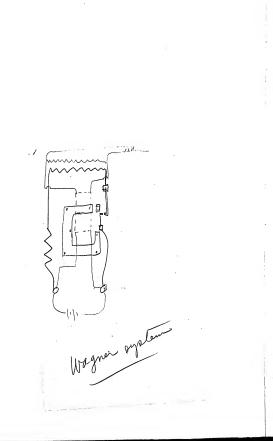
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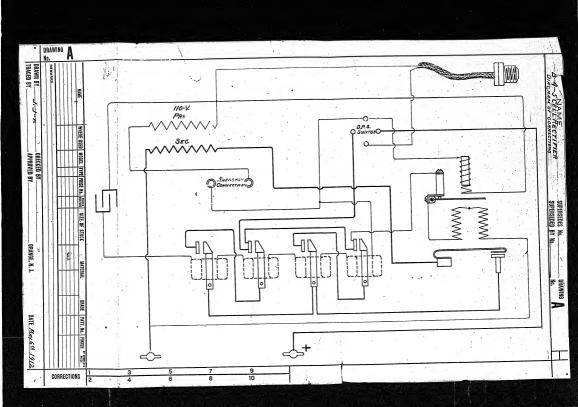
pec 607, 124 - Nogban.

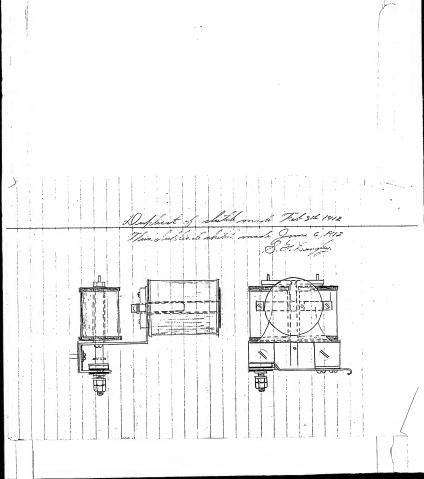


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F861

March 12, 1913

Conference with Mr. Langley on Vibrating Type of Alternating Current Rectifier.

Was informed for the first time that the armstures employed in the type of rectifier new put out consist each of two parts riveted together. An armsture consisting of two parts capable of independent vibration is not employed

H. L.

Su misself = Co you pay about of the Marked Constable to grow pay about Marked Water to color 10, 1916

Mr. Edison:-

POLIO 861 - application of Sam G. Langley for Means for Charging Storage Batteries

This application covers a system and apparatus for disconnecting the rectifying devices from the battery when the alternating current fails or falls below predatermined value and for reconnecting the same when the current increases to a predatermined value. The application was filed with claims for the system and also claims for the specific magnetic ewitches used in the system. Division was required and we slacted to retain the claims covering the system. The application has now been allowed with very good claims covering the system - ses for sxemple the following claims:-

1. In a system of the class described, the combination of a storage bettery and means for supplying unidirectional current thereto, including a source of alternating current, rectifying means, and means controlled by the voltage of eads source for commercing eats bettery to ead rectifying means, substantially as described.

5. In a system of the class described, the combination of a storage battery and means for supplying unidirectional current thereto, including a source of current, rectifying means, and means for automatically establishing connection between ead ctorage battery and sain restifying means whenever a predatermined electrical condition exists in said cource, subtentially as described.

5. In a system of the class described, the combination of a storage bettery and means for obstraing the same, including a source of alternating current, rectifying means, and contacts for making and breaking connection between the battery and the rectifying means, eaid contacts being automatically moved relatively to each other into circuit making or breaking position according to the electrical condition of eaid source, substantially as described.

presume you will wish this patent taken out. In this system there is smployed a relay switch and

a main switch, both mounted on the same way. The Patent Office considers these switches as asparate inventions and to secure protection on the same we would probably have to file two applications, one for each switch. Do you wish these applications

filed? I understand that this apparatus is still used.

Wenry Landon Howalouthis Constable Howalouthis

Mr. Edison:-

FOLIO 861 - application of Sam G. Langley for Means for Charging Storage Batteries

This application covers a system and apparatus for disconnecting the rectifying devices from the battery when the alternating ourrent fails or falls below predetermined value and for reconnecting the seme when the ourrent increases to a predetermined value. The application was filed with claims for the system and also claims for the epecific magnetic switches used in the system. Division was required and we elected to retain the claims covering the system. The application has now been allowed with very good claims covering the system - see for example the following claims:

- 1. In a system of the class described, the combination of a storage bettery and means for supplying unidirectional current therete, including a source of alternating current, rectifying means, and means controlled by the voltage of eald source for commenting eald battery to said rectifying means, substantially as described.
- 5. In a system of the class described, the combination of a ctorage battery and means for supplying unidirectional current thereto, including a source of current, rectifying means, and means for automatically establishing means whenever a predetermined clastical condition exists in said cource, substantially as described.
- 5. In a system of the class described, the combination of a storage betway and means for charging the same, including a source of alternating ourrent, rectifying means, and contacts for making and breaking connection between the battery and the rectifying means, eaid contacts being automatically moved relatively to each other into circuit making or breaking position according to the electrical condition of eaid source, substantially as described.

I presume you will wish this patent taken out.
In this system there is employed a relay switch and
a main switch, both mounted on the same frams. The Patent Offics
considers these switches as separate inventions and to secure
protection on the same we would probably have to file two applications, one for each switch. Do you wish these applications
filed? I understand that this apparatus is still used.

(Signed) Henry Lanahan

Mr. Meadoworoft:
Herewith copy of memorandum which was sent on October 16 1912 with the first best of the best 16 1912 with the first sent of the best 16 1912 with the first sent of the firs

October 19th, 1916.

Mr. Edison:

In answer to your memo of October 10th regarding

the advisability of taking out patent applications on the Rolay and Main Switch used on the Rectifier, I would advise that those points be thoroughly protected. Of course the rectifier at the present time is a comparatively small proposition, but I understand from Mr. Langley that the other Companies making such devices are covering every point of construction possible by patents and apparently there is a feeling that a similar rectifier will have an increase demand in the near future.

The Edison rectifier has certain very marked advantages over anything on the market so far, and I bolieve it would be good policy to cover these two points of construction as a safety measure The switch and rolay referred to are of rather novel

construction and there is a possibility of this construction being valuable in the future.

JPC:MSH

John P. Constable. OUT OF RUGINEER. Folio 861

Folio 861

Sam G. Langley

Means for Charging Storage Batteries

Serial No. 704, 388

Filed dure 16, 1912

Allowed July 22, 1916

Plant Foo May san. 22, 1917.

Mr. Holden:

Any foreign applications?

Any foreign applications?

When do you wish final fee paid?

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Patent Series

Patent Application Files

Folio # 860 Production of Sound-Records

U.S. Patent #: 1282011

Primary Applicant: Aylsworth, Jonas W

Date Executed: 6/17/1912

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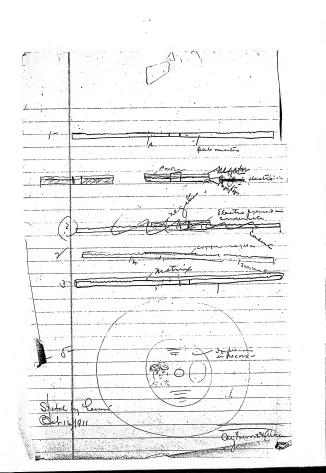
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JUL 1 - 1912 Have we patented new New Label + method in Center of new disc also Dolbran book

Patent Series Patent Application Files

Folio # 866 Process of Making Screens for Projection

U.S. Patent #: 1266778

Primary Applicant: Edison, Thomas A

Date Executed: 6/19/1912

Application for a screen Moving petines. Regular Smooth Oil Cloth This is heated when it Greones dicky. The bronzu dowder y Then applied collice the Luxued felm is hot a sticke The whale surface gets Coale atte particles are strong held cetter the cloth colds. + does not come off by rolling up or rough handling get parlitulais fro Dally as the best compositions of Brown

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or amethyst violet bronze founder ordning white oil clott -Heat the oil cloth - (clean at 100 lb pur) apply former perfectly with bruster so to such founder suto softened conting of oil dott permit treat & vil cloth to cool my with line & wil , prepartly boiled, myend with drive and temperature John die (white) - any eght color findly opening they forther from million.

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The brongs for turned, sho sporter.

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Edison: Application Fol. 8660 of the papers in

I hand you derewith our copies of the papers and your application Serial No. 705,648 filed June 24, 1912 on-

This application relates to a metion picture screen, made from ordinary cilcloth by slightly heating the cilcloth to render the surface thereof tacky and applying thereto this counting of powdered aluminum or powdered aluminum and fowdered bronze, and applying to the latter coating a pretective ceating of, drying oil such as a mixture of linseed oil, turpertine and white japan drior.

All the claims now in the application relating to the process of making the screen, seven in number, have been allowed, of which the following will serve as an example:

5. The process of making screens for projection purposes, which consists in heating cilcloth until the cilcloth surface becames soft and somewhat sticky, applying pendered material containing a metal to the seftoned and sticky surface, and rubbing the said material into the surface, substantially as described.

All the claims, six in number, relating to the article, however, have been finally rojected on U.S. patent to Price No. 995, 289 dated June 13, 1911, and French patent to Fey No. 588, 978, copies of which patents are attached hereto. The following will serve as an example of the article claims:

10/26/19 - Wer Chorde Eles on pays

/ A screen for projection purposee, consisting of cilcloth having metallic material adhering to the cilcloth coeting to produce a partially reflecting surface, esid surface having a thin coating of drying oil dried thereon, substantially ac described.

Kindly advice whether or not you wish an appeal taken in this application on the article claime.

In case you do not wieh an appeal taken will you please advise whether you wish the patent taken out with the process claims, or the application abandoned.

I understand that the screen described in this application is of no commercial value to us at the present time.

Wm. a. Stardy.

WH-RH

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